

## SEQUENCE LISTING

<110> Kwang , Jimmy  
Ling, Ai Ee  
Ooi, Eng Eong  
Chng, Hiok Hee

<120> Diagnostics and Vaccines for SARS

<130> 2577-162

<140> 60/ 486,918

<141> 2003-07-15

<160> 25

<170> PatentIn version 3.2

<210> 1

<211> 1269

<212> DNA

<213> SARS coronavirus

<220>

<221> CDS

<222> (1)..(1269)

<400> 1

atg tct gat aat gga ccc caa tca aac caa cgt agt gcc ccc cgc att	48
Met Ser Asp Asn Gly Pro Gln Ser Asn Gln Arg Ser Ala Pro Arg Ile	
1 5 10 15	
aca ttt ggt gga ccc aca gat tca act gac aat aac cag aat gga gga	96
Thr Phe Gly Gly Pro Thr Asp Ser Thr Asp Asn Asn Gln Asn Gly Gly	
20 25 30	
cgc aat ggg gca agg cca aaa cag cgc cga ccc caa ggt tta ccc aat	144
Arg Asn Gly Ala Arg Pro Lys Gln Arg Arg Pro Gln Gly Leu Pro Asn	
35 40 45	
aat act gcg tct tgg ttc aca gct ctc act cag cat ggc aag gag gaa	192
Asn Thr Ala Ser Trp Phe Thr Ala Leu Thr Gln His Gly Lys Glu Glu	
50 55 60	
ctt aga ttc cct cga ggc cag ggc gtt cca atc aac acc aat agt ggt	240
Leu Arg Phe Pro Arg Gly Gln Gly Val Pro Ile Asn Thr Asn Ser Gly	
65 70 75 80	
cca gat gac caa att ggc tac tac cga aga gct acc cga cga gtt cgt	288
Pro Asp Asp Gln Ile Gly Tyr Tyr Arg Arg Ala Thr Arg Arg Val Arg	
85 90 95	
ggt ggt gac ggc aaa atg aaa gag ctc agc ccc aga tgg tac ttc tat	336
Gly Gly Asp Gly Lys Met Lys Glu Leu Ser Pro Arg Trp Tyr Phe Tyr	

100	105	110	
tac cta gga act ggc cca gaa gct tca ctt ccc tac ggc gct aac aaa			384
Tyr Leu Gly Thr Gly Pro Glu Ala Ser Leu Pro Tyr Gly Ala Asn Lys			
115	120	125	
gaa ggc atc gta tgg gtt gca act gag gga gcc ttg aat aca ccc aaa			432
Glu Gly Ile Val Trp Val Ala Thr Glu Gly Ala Leu Asn Thr Pro Lys			
130	135	140	
gac cac att ggc acc cgc aat cct aat aac aat gct gcc acc gtg cta			480
Asp His Ile Gly Thr Arg Asn Pro Asn Asn Asn Ala Ala Thr Val Leu			
145	150	155	160
caa ctt cct caa gga aca aca ttg cca aaa ggc ttc tac gca gag gga			528
Gln Leu Pro Gln Gly Thr Thr Leu Pro Lys Gly Phe Tyr Ala Glu Gly			
165	170	175	
agc aga ggc ggc agt caa gcc tct tct cgc tcc tca tca cgt agt cgc			576
Ser Arg Gly Gly Ser Gln Ala Ser Ser Arg Ser Ser Ser Arg Ser Arg			
180	185	190	
ggt aat tca aga aat tca act cct ggc agc agt agg gga aat tct cct			624
Gly Asn Ser Arg Asn Ser Thr Pro Gly Ser Ser Arg Gly Asn Ser Pro			
195	200	205	
gct cga atg gct agc gga ggt ggt gaa act gcc ctc gcg cta ttg ctg			672
Ala Arg Met Ala Ser Gly Gly Gly Glu Thr Ala Leu Ala Leu Leu Leu			
210	215	220	
cta gac aga ttg aac cag ctt gag agc aaa gtt tct ggt aaa ggc caa			720
Leu Asp Arg Leu Asn Gln Leu Glu Ser Lys Val Ser Gly Lys Gly Gln			
225	230	235	240
caa caa caa ggc caa act gtc act aag aaa tct gct gct gag gca tct			768
Gln Gln Gln Gly Gln Thr Val Thr Lys Lys Ser Ala Ala Glu Ala Ser			
245	250	255	
aaa aag cct cgc caa aaa cgt act gcc aca aaa cag tac aac gtc act			816
Lys Lys Pro Arg Gln Lys Arg Thr Ala Thr Lys Gln Tyr Asn Val Thr			
260	265	270	
caa gca ttt ggg aga cgt ggt cca gaa caa acc caa gga aat ttc ggg			864
Gln Ala Phe Gly Arg Arg Gly Pro Glu Gln Thr Gln Gly Asn Phe Gly			
275	280	285	
gac caa gac cta atc aga caa gga act gat tac aaa cat tgg ccg caa			912
Asp Gln Asp Leu Ile Arg Gln Gly Thr Asp Tyr Lys His Trp Pro Gln			
290	295	300	
att gca caa ttt gct cca agt gcc tct gca ttc ttt gga atg tca cgc			960
Ile Ala Gln Phe Ala Pro Ser Ala Ser Ala Phe Phe Gly Met Ser Arg			
305	310	315	320
att ggc atg gaa gtc aca cct tcg gga aca tgg ctg act tat cat gga			1008

Ile Gly Met Glu Val Thr Pro Ser Gly Thr Trp Leu Thr Tyr His Gly  
 325 330 335

gcc att aaa ttg gat gac aaa gat cca caa ttc aaa gac aac gtc ata 1056  
 Ala Ile Lys Leu Asp Asp Lys Asp Pro Gln Phe Lys Asp Asn Val Ile  
 340 345 350

ctg ctg aac aag cac att gac gca tac aaa aca ttc cca cca aca gag 1104  
 Leu Leu Asn Lys His Ile Asp Ala Tyr Lys Thr Phe Pro Pro Thr Glu  
 355 360 365

cct aaa aag gac aaa aag aaa aag act gat gaa gct cag cct ttg ccg 1152  
 Pro Lys Lys Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro Leu Pro  
 370 375 380

cag aga caa aag aag cag ccc act gtg act ctt ctt cct gcg gct gac 1200  
 Gln Arg Gln Lys Lys Gln Pro Thr Val Thr Leu Leu Pro Ala Ala Asp  
 385 390 395 400

atg gat gat ttc tcc aga caa ctt caa aat tcc atg agt gga gct tct 1248  
 Met Asp Asp Phe Ser Arg Gln Leu Gln Asn Ser Met Ser Gly Ala Ser  
 405 410 415

gct gat tca act cag gca taa 1269  
 Ala Asp Ser Thr Gln Ala  
 420

<210> 2  
 <211> 422  
 <212> PRT  
 <213> SARS coronavirus

<400> 2

Met Ser Asp Asn Gly Pro Gln Ser Asn Gln Arg Ser Ala Pro Arg Ile  
 1 5 10 15

Thr Phe Gly Gly Pro Thr Asp Ser Thr Asp Asn Asn Gln Asn Gly Gly  
 20 25 30

Arg Asn Gly Ala Arg Pro Lys Gln Arg Arg Pro Gln Gly Leu Pro Asn  
 35 40 45

Asn Thr Ala Ser Trp Phe Thr Ala Leu Thr Gln His Gly Lys Glu Glu  
 50 55 60

Leu Arg Phe Pro Arg Gly Gln Gly Val Pro Ile Asn Thr Asn Ser Gly  
 65 70 75 80

Pro Asp Asp Gln Ile Gly Tyr Tyr Arg Arg Ala Thr Arg Arg Val Arg  
                     85                                    90                                    95

Gly Gly Asp Gly Lys Met Lys Glu Leu Ser Pro Arg Trp Tyr Phe Tyr  
                     100                                    105                                    110

Tyr Leu Gly Thr Gly Pro Glu Ala Ser Leu Pro Tyr Gly Ala Asn Lys  
                     115                                    120                                    125

Glu Gly Ile Val Trp Val Ala Thr Glu Gly Ala Leu Asn Thr Pro Lys  
                     130                                    135                                    140

Asp His Ile Gly Thr Arg Asn Pro Asn Asn Asn Ala Ala Thr Val Leu  
                     145                                    150                                    155                                    160

Gln Leu Pro Gln Gly Thr Thr Leu Pro Lys Gly Phe Tyr Ala Glu Gly  
                     165                                    170                                    175

Ser Arg Gly Gly Ser Gln Ala Ser Ser Arg Ser Ser Ser Arg Ser Arg  
                     180                                    185                                    190

Gly Asn Ser Arg Asn Ser Thr Pro Gly Ser Ser Arg Gly Asn Ser Pro  
                     195                                    200                                    205

Ala Arg Met Ala Ser Gly Gly Gly Glu Thr Ala Leu Ala Leu Leu Leu  
                     210                                    215                                    220

Leu Asp Arg Leu Asn Gln Leu Glu Ser Lys Val Ser Gly Lys Gly Gln  
                     225                                    230                                    235                                    240

Gln Gln Gln Gly Gln Thr Val Thr Lys Lys Ser Ala Ala Glu Ala Ser  
                     245                                    250                                    255

Lys Lys Pro Arg Gln Lys Arg Thr Ala Thr Lys Gln Tyr Asn Val Thr  
                     260                                    265                                    270

Gln Ala Phe Gly Arg Arg Gly Pro Glu Gln Thr Gln Gly Asn Phe Gly  
                     275                                    280                                    285

Asp Gln Asp Leu Ile Arg Gln Gly Thr Asp Tyr Lys His Trp Pro Gln  
                     290                                    295                                    300

Ile Ala Gln Phe Ala Pro Ser Ala Ser Ala Phe Phe Gly Met Ser Arg  
 305 310 315 320

Ile Gly Met Glu Val Thr Pro Ser Gly Thr Trp Leu Thr Tyr His Gly  
 325 330 335

Ala Ile Lys Leu Asp Asp Lys Asp Pro Gln Phe Lys Asp Asn Val Ile  
 340 345 350

Leu Leu Asn Lys His Ile Asp Ala Tyr Lys Thr Phe Pro Pro Thr Glu  
 355 360 365

Pro Lys Lys Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro Leu Pro  
 370 375 380

Gln Arg Gln Lys Lys Gln Pro Thr Val Thr Leu Leu Pro Ala Ala Asp  
 385 390 395 400

Met Asp Asp Phe Ser Arg Gln Leu Gln Asn Ser Met Ser Gly Ala Ser  
 405 410 415

Ala Asp Ser Thr Gln Ala  
 420

<210> 3  
 <211> 3768  
 <212> DNA  
 <213> SARS coronavirus

<220>  
 <221> CDS  
 <222> (1)..(3768)

<400> 3  
 atg ttt att ttc tta tta ttt ctt act ctc act agt ggt agt gac ctt 48  
 Met Phe Ile Phe Leu Leu Phe Leu Thr Leu Thr Ser Gly Ser Asp Leu  
 1 5 10 15

gac cgg tgc acc act ttt gat gat gtt caa gct cct aat tac act caa 96  
 Asp Arg Cys Thr Thr Phe Asp Asp Val Gln Ala Pro Asn Tyr Thr Gln  
 20 25 30

cat act tca tct atg agg ggg gtt tac tat cct gat gaa att ttt aga 144  
 His Thr Ser Ser Met Arg Gly Val Tyr Tyr Pro Asp Glu Ile Phe Arg  
 35 40 45

tca gac act ctt tat tta act cag gat tta ttt ctt cca ttt tat tct Ser Asp Thr Leu Tyr Leu Thr Gln Asp Leu Phe Leu Pro Phe Tyr Ser 50 55 60	192
aat gtt aca ggg ttt cat act att aat cat acg ttt ggc aac cct gtc Asn Val Thr Gly Phe His Thr Ile Asn His Thr Phe Gly Asn Pro Val 65 70 75 80	240
ata cct ttt aag gat ggt att tat ttt gct gcc aca gag aaa tca aat Ile Pro Phe Lys Asp Gly Ile Tyr Phe Ala Ala Thr Glu Lys Ser Asn 85 90 95	288
gtt gtc cgt ggt tgg gtt ttt ggt tct acc atg aac aac aag tca cag Val Val Arg Gly Trp Val Phe Gly Ser Thr Met Asn Asn Lys Ser Gln 100 105 110	336
tcg gtg att att att aac aat tct act aat gtt gtt ata cga gca tgt Ser Val Ile Ile Ile Asn Asn Ser Thr Asn Val Val Ile Arg Ala Cys 115 120 125	384
aac ttt gaa ttg tgt gac aac cct ttc ttt gct gtt tct aaa ccc atg Asn Phe Glu Leu Cys Asp Asn Pro Phe Phe Ala Val Ser Lys Pro Met 130 135 140	432
ggt aca cag aca cat act atg ata ttc gat aat gca ttt aat tgc act Gly Thr Gln Thr His Thr Met Ile Phe Asp Asn Ala Phe Asn Cys Thr 145 150 155 160	480
ttc gag tac ata tct gat gcc ttt tcg ctt gat gtt tca gaa aag tca Phe Glu Tyr Ile Ser Asp Ala Phe Ser Leu Asp Val Ser Glu Lys Ser 165 170 175	528
ggt aat ttt aaa cac tta cga gag ttt gtg ttt aaa aat aaa gat ggg Gly Asn Phe Lys His Leu Arg Glu Phe Val Phe Lys Asn Lys Asp Gly 180 185 190	576
ttt ctc tat gtt tat aag ggc tat caa cct ata gat gta gtt cgt gat Phe Leu Tyr Val Tyr Lys Gly Tyr Gln Pro Ile Asp Val Val Arg Asp 195 200 205	624
cta cct tct ggt ttt aac act ttg aaa cct att ttt aag ttg cct ctt Leu Pro Ser Gly Phe Asn Thr Leu Lys Pro Ile Phe Lys Leu Pro Leu 210 215 220	672
ggt att aac att aca aat ttt aga gcc att ctt aca gcc ttt tca cct Gly Ile Asn Ile Thr Asn Phe Arg Ala Ile Leu Thr Ala Phe Ser Pro 225 230 235 240	720
gct caa gac att tgg ggc acg tca gct gca gcc tat ttt gtt ggc tat Ala Gln Asp Ile Trp Gly Thr Ser Ala Ala Ala Tyr Phe Val Gly Tyr 245 250 255	768
tta aag cca act aca ttt atg ctc aag tat gat gaa aat ggt aca atc Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu Asn Gly Thr Ile	816

260	265	270	
aca gat gct gtt gat tgt tct caa aat cca ctt gct gaa ctc aaa tgc Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala Glu Leu Lys Cys 275 280 285			864
tct gtt aag agc ttt gag att gac aaa gga att tac cag acc tct aat Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr Gln Thr Ser Asn 290 295 300			912
ttc agg gtt gtt ccc tca gga gat gtt gtg aga ttc cct aat att aca Phe Arg Val Val Pro Ser Gly Asp Val Val Arg Phe Pro Asn Ile Thr 305 310 315 320			960
aac ttg tgt cct ttt gga gag gtt ttt aat gct act aaa ttc cct tct Asn Leu Cys Pro Phe Gly Glu Val Phe Asn Ala Thr Lys Phe Pro Ser 325 330 335			1008
gtc tat gca tgg gag aga aaa aaa att tct aat tgt gtt gct gat tac Val Tyr Ala Trp Glu Arg Lys Lys Ile Ser Asn Cys Val Ala Asp Tyr 340 345 350			1056
tct gtg ctc tac aac tca aca ttt ttt tca acc ttt aag tgc tat ggc Ser Val Leu Tyr Asn Ser Thr Phe Phe Ser Thr Phe Lys Cys Tyr Gly 355 360 365			1104
gtt tct gcc act aag ttg aat gat ctt tgc ttc tcc aat gtc tat gca Val Ser Ala Thr Lys Leu Asn Asp Leu Cys Phe Ser Asn Val Tyr Ala 370 375 380			1152
gat tct ttt gta gtc aag gga gat gat gta aga caa ata gcg cca gga Asp Ser Phe Val Val Lys Gly Asp Asp Val Arg Gln Ile Ala Pro Gly 385 390 395 400			1200
caa act ggt gtt att gct gat tat aat tat aaa ttg cca gat gat ttc Gln Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu Pro Asp Asp Phe 405 410 415			1248
atg ggt tgt gtc ctt gct tgg aat act agg aac att gat gct act tca Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile Asp Ala Thr Ser 420 425 430			1296
act ggt aat tat aat tat aaa tat agg tat ctt aga cat ggc aag ctt Thr Gly Asn Tyr Asn Tyr Lys Tyr Arg Tyr Leu Arg His Gly Lys Leu 435 440 445			1344
agg ccc ttt gag aga gac ata tct aat gtg cct ttc tcc cct gat ggc Arg Pro Phe Glu Arg Asp Ile Ser Asn Val Pro Phe Ser Pro Asp Gly 450 455 460			1392
aaa cct tgc acc cca cct gct ctt aat tgt tat tgg cca tta aat gat Lys Pro Cys Thr Pro Pro Ala Leu Asn Cys Tyr Trp Pro Leu Asn Asp 465 470 475 480			1440
tat ggt ttt tac acc act act ggc att ggc tac caa cct tac aga gtt			1488

Tyr	Gly	Phe	Tyr	Thr	Thr	Thr	Gly	Ile	Gly	Tyr	Gln	Pro	Tyr	Arg	Val	
				485					490					495		
gta	gta	ctt	tct	ttt	gaa	ctt	tta	aat	gca	ccg	gcc	acg	gtt	tgt	gga	1536
Val	Val	Leu	Ser	Phe	Glu	Leu	Leu	Asn	Ala	Pro	Ala	Thr	Val	Cys	Gly	
			500					505					510			
cca	aaa	tta	tcc	act	gac	ctt	att	aag	aac	cag	tgt	gtc	aat	ttt	aat	1584
Pro	Lys	Leu	Ser	Thr	Asp	Leu	Ile	Lys	Asn	Gln	Cys	Val	Asn	Phe	Asn	
			515				520					525				
ttt	aat	gga	ctc	act	ggg	act	ggg	gtg	tta	act	cct	tct	tca	aag	aga	1632
Phe	Asn	Gly	Leu	Thr	Gly	Thr	Gly	Val	Leu	Thr	Pro	Ser	Ser	Lys	Arg	
		530				535					540					
ttt	caa	cca	ttt	caa	caa	ttt	ggc	cgt	gat	gtt	tct	gat	ttc	act	gat	1680
Phe	Gln	Pro	Phe	Gln	Gln	Phe	Gly	Arg	Asp	Val	Ser	Asp	Phe	Thr	Asp	
					550					555					560	
tcc	gtt	cga	gat	cct	aaa	aca	tct	gaa	ata	tta	gac	att	tca	cct	tgc	1728
Ser	Val	Arg	Asp	Pro	Lys	Thr	Ser	Glu	Ile	Leu	Asp	Ile	Ser	Pro	Cys	
				565				570						575		
tct	ttt	ggg	ggg	gta	agt	gta	att	aca	cct	gga	aca	aat	gct	tca	tct	1776
Ser	Phe	Gly	Gly	Val	Ser	Val	Ile	Thr	Pro	Gly	Thr	Asn	Ala	Ser	Ser	
			580					585					590			
gaa	gtt	gct	gtt	cta	tat	caa	gat	gtt	aac	tgc	act	gat	gtt	tct	aca	1824
Glu	Val	Ala	Val	Leu	Tyr	Gln	Asp	Val	Asn	Cys	Thr	Asp	Val	Ser	Thr	
			595				600					605				
gca	att	cat	gca	gat	caa	ctc	aca	cca	gct	tgg	cgc	ata	tat	tct	act	1872
Ala	Ile	His	Ala	Asp	Gln	Leu	Thr	Pro	Ala	Trp	Arg	Ile	Tyr	Ser	Thr	
		610				615					620					
gga	aac	aat	gta	ttc	cag	act	caa	gca	ggc	tgt	ctt	ata	gga	gct	gag	1920
Gly	Asn	Asn	Val	Phe	Gln	Thr	Gln	Ala	Gly	Cys	Leu	Ile	Gly	Ala	Glu	
					630					635					640	
cat	gtc	gac	act	tct	tat	gag	tgc	gac	att	cct	att	gga	gct	ggc	att	1968
His	Val	Asp	Thr	Ser	Tyr	Glu	Cys	Asp	Ile	Pro	Ile	Gly	Ala	Gly	Ile	
				645				650						655		
tgt	gct	agt	tac	cat	aca	gtt	tct	tta	tta	cgt	agt	act	agc	caa	aaa	2016
Cys	Ala	Ser	Tyr	His	Thr	Val	Ser	Leu	Leu	Arg	Ser	Thr	Ser	Gln	Lys	
			660					665					670			
tct	att	gtg	gct	tat	act	atg	tct	tta	ggg	gct	gat	agt	tca	att	gct	2064
Ser	Ile	Val	Ala	Tyr	Thr	Met	Ser	Leu	Gly	Ala	Asp	Ser	Ser	Ile	Ala	
			675				680					685				
tac	tct	aat	aac	acc	att	gct	ata	cct	act	aac	ttt	tca	att	agc	att	2112
Tyr	Ser	Asn	Asn	Thr	Ile	Ala	Ile	Pro	Thr	Asn	Phe	Ser	Ile	Ser	Ile	
			690				695					700				



act aca gaa gta atg cct gtt tct atg gct aaa acc tcc gta gat tgt	2160
Thr Thr Glu Val Met Pro Val Ser Met Ala Lys Thr Ser Val Asp Cys	
705 710 715 720	
aat atg tac atc tgc gga gat tct act gaa tgt gct aat ttg ctt ctc	2208
Asn Met Tyr Ile Cys Gly Asp Ser Thr Glu Cys Ala Asn Leu Leu Leu	
725 730 735	
caa tat ggt agc ttt tgc aca caa cta aat cgt gca ctc tca ggt att	2256
Gln Tyr Gly Ser Phe Cys Thr Gln Leu Asn Arg Ala Leu Ser Gly Ile	
740 745 750	
gct gct gaa cag gat cgc aac aca cgt gaa gtg ttc gct caa gtt aaa	2304
Ala Ala Glu Gln Asp Arg Asn Thr Arg Glu Val Phe Ala Gln Val Lys	
755 760 765	
caa atg tac aaa acc cca act ttg aaa tat ttt ggt ggt ttt aat ttt	2352
Gln Met Tyr Lys Thr Pro Thr Leu Lys Tyr Phe Gly Gly Phe Asn Phe	
770 775 780	
tca caa ata tta cct gac cct cta aag cca act aag agg tct ttt att	2400
Ser Gln Ile Leu Pro Asp Pro Leu Lys Pro Thr Lys Arg Ser Phe Ile	
785 790 795 800	
gag gac ttg ctc ttt aat aag gtg aca ctc gct gat gct ggc ttc atg	2448
Glu Asp Leu Leu Phe Asn Lys Val Thr Leu Ala Asp Ala Gly Phe Met	
805 810 815	
aag caa tat ggc gaa tgc cta ggt gat att aat gct aga gat ctc att	2496
Lys Gln Tyr Gly Glu Cys Leu Gly Asp Ile Asn Ala Arg Asp Leu Ile	
820 825 830	
tgt gcg cag aag ttc aat gga ctt aca gtg ttg cca cct ctg ctc act	2544
Cys Ala Gln Lys Phe Asn Gly Leu Thr Val Leu Pro Pro Leu Leu Thr	
835 840 845	
gat gat atg att gct gcc tac act gct gct cta gtt agt ggt act gcc	2592
Asp Asp Met Ile Ala Ala Tyr Thr Ala Ala Leu Val Ser Gly Thr Ala	
850 855 860	
act gct gga tgg aca ttt ggt gct ggc gct gct ctt caa ata cct ttt	2640
Thr Ala Gly Trp Thr Phe Gly Ala Gly Ala Ala Leu Gln Ile Pro Phe	
865 870 875 880	
gct atg caa atg gca tat agg ttc aat ggc att gga gtt acc caa aat	2688
Ala Met Gln Met Ala Tyr Arg Phe Asn Gly Ile Gly Val Thr Gln Asn	
885 890 895	
gtt ctc tat gag aac caa aaa caa atc gcc aac caa ttt aac aag gcg	2736
Val Leu Tyr Glu Asn Gln Lys Gln Ile Ala Asn Gln Phe Asn Lys Ala	
900 905 910	
att agt caa att caa gaa tca ctt aca aca aca tca act gca ttg ggc	2784
Ile Ser Gln Ile Gln Glu Ser Leu Thr Thr Thr Ser Thr Ala Leu Gly	
915 920 925	

aag ctg caa gac gtt gtt aac cag aat gct caa gca tta aac aca ctt Lys Leu Gln Asp Val Val Asn Gln Asn Ala Gln Ala Leu Asn Thr Leu 930 935 940	2832
gtt aaa caa ctt agc tct aat ttt ggt gca att tca agt gtg cta aat Val Lys Gln Leu Ser Ser Asn Phe Gly Ala Ile Ser Ser Val Leu Asn 945 950 955 960	2880
gat atc ctt tct cga ctt gat aaa gtc gag gcg gag gta caa att gac Asp Ile Leu Ser Arg Leu Asp Lys Val Glu Ala Glu Val Gln Ile Asp 965 970 975	2928
agg tta att aca ggc aga ctt caa agc ctt caa acc tat gta aca caa Arg Leu Ile Thr Gly Arg Leu Gln Ser Leu Gln Thr Tyr Val Thr Gln 980 985 990	2976
caa cta atc agg gct gct gaa atc agg gct tct gct aat ctt gct gct Gln Leu Ile Arg Ala Ala Glu Ile Arg Ala Ser Ala Asn Leu Ala Ala 995 1000 1005	3024
act aaa atg tct gag tgt gtt ctt gga caa tca aaa aga gtt gac Thr Lys Met Ser Glu Cys Val Leu Gly Gln Ser Lys Arg Val Asp 1010 1015 1020	3069
ttt tgt gga aag ggc tac cac ctt atg tcc ttc cca caa gca gcc Phe Cys Gly Lys Gly Tyr His Leu Met Ser Phe Pro Gln Ala Ala 1025 1030 1035	3114
ccg cat ggt gtt gtc ttc cta cat gtc acg tat gtg cca tcc cag Pro His Gly Val Val Phe Leu His Val Thr Tyr Val Pro Ser Gln 1040 1045 1050	3159
gag agg aac ttc acc aca gcg cca gca att tgt cat gaa ggc aaa Glu Arg Asn Phe Thr Thr Ala Pro Ala Ile Cys His Glu Gly Lys 1055 1060 1065	3204
gca tac ttc cct cgt gaa ggt gtt ttt gtg ttt aat ggc act tct Ala Tyr Phe Pro Arg Glu Gly Val Phe Val Phe Asn Gly Thr Ser 1070 1075 1080	3249
tgg ttt att aca cag agg aac ttc ttt tct cca caa ata att act Trp Phe Ile Thr Gln Arg Asn Phe Phe Ser Pro Gln Ile Ile Thr 1085 1090 1095	3294
aca gac aat aca ttt gtc tca gga aat tgt gat gtc gtt att ggc Thr Asp Asn Thr Phe Val Ser Gly Asn Cys Asp Val Val Ile Gly 1100 1105 1110	3339
atc att aac aac aca gtt tat gat cct ctg caa cct gag ctt gac Ile Ile Asn Asn Thr Val Tyr Asp Pro Leu Gln Pro Glu Leu Asp 1115 1120 1125	3384
tca ttc aaa gaa gag ctg gac aag tac ttc aaa aat cat aca tca Ser Phe Lys Glu Glu Leu Asp Lys Tyr Phe Lys Asn His Thr Ser 1130 1135 1140	3429

1130	1135	1140	
cca gat gtt gat ctt ggc gac	att tca ggc att aac	gct tct gtc	3474
Pro Asp Val Asp Leu Gly Asp	Ile Ser Gly Ile Asn	Ala Ser Val	
1145	1150	1155	
gtc aac att caa aaa gaa att	gac cgc ctc aat gag	gtc gct aaa	3519
Val Asn Ile Gln Lys Glu Ile	Asp Arg Leu Asn Glu	Val Ala Lys	
1160	1165	1170	
aat tta aat gaa tca ctc att	gac ctt caa gaa ttg	gga aaa tat	3564
Asn Leu Asn Glu Ser Leu Ile	Asp Leu Gln Glu Leu	Gly Lys Tyr	
1175	1180	1185	
gag caa tat att aaa tgg cct	tgg tat gtt tgg ctc	ggc ttc att	3609
Glu Gln Tyr Ile Lys Trp Pro	Trp Tyr Val Trp Leu	Gly Phe Ile	
1190	1195	1200	
gct gga cta att gcc atc gtc	atg gtt aca atc ttg	ctt tgt tgc	3654
Ala Gly Leu Ile Ala Ile Val	Met Val Thr Ile Leu	Leu Cys Cys	
1205	1210	1215	
atg act agt tgt tgc agt tgc	ctc aag ggt gca tgc	tct tgt ggt	3699
Met Thr Ser Cys Cys Ser Cys	Leu Lys Gly Ala Cys	Ser Cys Gly	
1220	1225	1230	
tct tgc tgc aag ttt gat gag	gat gac tct gag cca	gtt ctc aag	3744
Ser Cys Cys Lys Phe Asp Glu	Asp Asp Ser Glu Pro	Val Leu Lys	
1235	1240	1245	
ggt gtc aaa tta cat tac aca	taa		3768
Gly Val Lys Leu His Tyr Thr			
1250	1255		

<210> 4  
 <211> 1255  
 <212> PRT  
 <213> SARS coronavirus

<400> 4

Met Phe Ile Phe Leu Leu Phe Leu Thr Leu Thr Ser Gly Ser Asp Leu  
 1 5 10 15

Asp Arg Cys Thr Thr Phe Asp Asp Val Gln Ala Pro Asn Tyr Thr Gln  
 20 25 30

His Thr Ser Ser Met Arg Gly Val Tyr Tyr Pro Asp Glu Ile Phe Arg  
 35 40 45

Ser Asp Thr Leu Tyr Leu Thr Gln Asp Leu Phe Leu Pro Phe Tyr Ser

50	55	60
Asn Val Thr Gly Phe His Thr Ile Asn His Thr Phe Gly Asn Pro Val		
65	70	75 80
Ile Pro Phe Lys Asp Gly Ile Tyr Phe Ala Ala Thr Glu Lys Ser Asn		
	85	90 95
Val Val Arg Gly Trp Val Phe Gly Ser Thr Met Asn Asn Lys Ser Gln		
	100	105 110
Ser Val Ile Ile Ile Asn Asn Ser Thr Asn Val Val Ile Arg Ala Cys		
	115	120 125
Asn Phe Glu Leu Cys Asp Asn Pro Phe Phe Ala Val Ser Lys Pro Met		
	130	135 140
Gly Thr Gln Thr His Thr Met Ile Phe Asp Asn Ala Phe Asn Cys Thr		
145	150	155 160
Phe Glu Tyr Ile Ser Asp Ala Phe Ser Leu Asp Val Ser Glu Lys Ser		
	165	170 175
Gly Asn Phe Lys His Leu Arg Glu Phe Val Phe Lys Asn Lys Asp Gly		
	180	185 190
Phe Leu Tyr Val Tyr Lys Gly Tyr Gln Pro Ile Asp Val Val Arg Asp		
	195	200 205
Leu Pro Ser Gly Phe Asn Thr Leu Lys Pro Ile Phe Lys Leu Pro Leu		
	210	215 220
Gly Ile Asn Ile Thr Asn Phe Arg Ala Ile Leu Thr Ala Phe Ser Pro		
225	230	235 240
Ala Gln Asp Ile Trp Gly Thr Ser Ala Ala Ala Tyr Phe Val Gly Tyr		
	245	250 255
Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu Asn Gly Thr Ile		
	260	265 270

Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala Glu Leu Lys Cys  
 275 280 285

Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr Gln Thr Ser Asn  
 290 295 300

Phe Arg Val Val Pro Ser Gly Asp Val Val Arg Phe Pro Asn Ile Thr  
 305 310 315 320

Asn Leu Cys Pro Phe Gly Glu Val Phe Asn Ala Thr Lys Phe Pro Ser  
 325 330 335

Val Tyr Ala Trp Glu Arg Lys Lys Ile Ser Asn Cys Val Ala Asp Tyr  
 340 345 350

Ser Val Leu Tyr Asn Ser Thr Phe Phe Ser Thr Phe Lys Cys Tyr Gly  
 355 360 365

Val Ser Ala Thr Lys Leu Asn Asp Leu Cys Phe Ser Asn Val Tyr Ala  
 370 375 380

Asp Ser Phe Val Val Lys Gly Asp Asp Val Arg Gln Ile Ala Pro Gly  
 385 390 395 400

Gln Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu Pro Asp Asp Phe  
 405 410 415

Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile Asp Ala Thr Ser  
 420 425 430

Thr Gly Asn Tyr Asn Tyr Lys Tyr Arg Tyr Leu Arg His Gly Lys Leu  
 435 440 445

Arg Pro Phe Glu Arg Asp Ile Ser Asn Val Pro Phe Ser Pro Asp Gly  
 450 455 460

Lys Pro Cys Thr Pro Pro Ala Leu Asn Cys Tyr Trp Pro Leu Asn Asp  
 465 470 475 480

Tyr Gly Phe Tyr Thr Thr Thr Gly Ile Gly Tyr Gln Pro Tyr Arg Val  
 485 490 495

Val Val Leu Ser Phe Glu Leu Leu Asn Ala Pro Ala Thr Val Cys Gly  
500 505 510

Pro Lys Leu Ser Thr Asp Leu Ile Lys Asn Gln Cys Val Asn Phe Asn  
515 520 525

Phe Asn Gly Leu Thr Gly Thr Gly Val Leu Thr Pro Ser Ser Lys Arg  
530 535 540

Phe Gln Pro Phe Gln Gln Phe Gly Arg Asp Val Ser Asp Phe Thr Asp  
545 550 555 560

Ser Val Arg Asp Pro Lys Thr Ser Glu Ile Leu Asp Ile Ser Pro Cys  
565 570 575

Ser Phe Gly Gly Val Ser Val Ile Thr Pro Gly Thr Asn Ala Ser Ser  
580 585 590

Glu Val Ala Val Leu Tyr Gln Asp Val Asn Cys Thr Asp Val Ser Thr  
595 600 605

Ala Ile His Ala Asp Gln Leu Thr Pro Ala Trp Arg Ile Tyr Ser Thr  
610 615 620

Gly Asn Asn Val Phe Gln Thr Gln Ala Gly Cys Leu Ile Gly Ala Glu  
625 630 635 640

His Val Asp Thr Ser Tyr Glu Cys Asp Ile Pro Ile Gly Ala Gly Ile  
645 650 655

Cys Ala Ser Tyr His Thr Val Ser Leu Leu Arg Ser Thr Ser Gln Lys  
660 665 670

Ser Ile Val Ala Tyr Thr Met Ser Leu Gly Ala Asp Ser Ser Ile Ala  
675 680 685

Tyr Ser Asn Asn Thr Ile Ala Ile Pro Thr Asn Phe Ser Ile Ser Ile  
690 695 700

Thr Thr Glu Val Met Pro Val Ser Met Ala Lys Thr Ser Val Asp Cys  
705 710 715 720

Asn Met Tyr Ile Cys Gly Asp Ser Thr Glu Cys Ala Asn Leu Leu Leu  
 725 730 735

Gln Tyr Gly Ser Phe Cys Thr Gln Leu Asn Arg Ala Leu Ser Gly Ile  
 740 745 750

Ala Ala Glu Gln Asp Arg Asn Thr Arg Glu Val Phe Ala Gln Val Lys  
 755 760 765

Gln Met Tyr Lys Thr Pro Thr Leu Lys Tyr Phe Gly Gly Phe Asn Phe  
 770 775 780

Ser Gln Ile Leu Pro Asp Pro Leu Lys Pro Thr Lys Arg Ser Phe Ile  
 785 790 795 800

Glu Asp Leu Leu Phe Asn Lys Val Thr Leu Ala Asp Ala Gly Phe Met  
 805 810 815

Lys Gln Tyr Gly Glu Cys Leu Gly Asp Ile Asn Ala Arg Asp Leu Ile  
 820 825 830

Cys Ala Gln Lys Phe Asn Gly Leu Thr Val Leu Pro Pro Leu Leu Thr  
 835 840 845

Asp Asp Met Ile Ala Ala Tyr Thr Ala Ala Leu Val Ser Gly Thr Ala  
 850 855 860

Thr Ala Gly Trp Thr Phe Gly Ala Gly Ala Ala Leu Gln Ile Pro Phe  
 865 870 875 880

Ala Met Gln Met Ala Tyr Arg Phe Asn Gly Ile Gly Val Thr Gln Asn  
 885 890 895

Val Leu Tyr Glu Asn Gln Lys Gln Ile Ala Asn Gln Phe Asn Lys Ala  
 900 905 910

Ile Ser Gln Ile Gln Glu Ser Leu Thr Thr Thr Ser Thr Ala Leu Gly  
 915 920 925

Lys Leu Gln Asp Val Val Asn Gln Asn Ala Gln Ala Leu Asn Thr Leu

930	935	940
Val Lys Gln Leu Ser Ser Asn Phe Gly Ala Ile Ser Ser Val Leu Asn 945 950 955 960		
Asp Ile Leu Ser Arg Leu Asp Lys Val Glu Ala Glu Val Gln Ile Asp 965 970 975		
Arg Leu Ile Thr Gly Arg Leu Gln Ser Leu Gln Thr Tyr Val Thr Gln 980 985 990		
Gln Leu Ile Arg Ala Ala Glu Ile Arg Ala Ser Ala Asn Leu Ala Ala 995 1000 1005		
Thr Lys Met Ser Glu Cys Val Leu Gly Gln Ser Lys Arg Val Asp 1010 1015 1020		
Phe Cys Gly Lys Gly Tyr His Leu Met Ser Phe Pro Gln Ala Ala 1025 1030 1035		
Pro His Gly Val Val Phe Leu His Val Thr Tyr Val Pro Ser Gln 1040 1045 1050		
Glu Arg Asn Phe Thr Thr Ala Pro Ala Ile Cys His Glu Gly Lys 1055 1060 1065		
Ala Tyr Phe Pro Arg Glu Gly Val Phe Val Phe Asn Gly Thr Ser 1070 1075 1080		
Trp Phe Ile Thr Gln Arg Asn Phe Phe Ser Pro Gln Ile Ile Thr 1085 1090 1095		
Thr Asp Asn Thr Phe Val Ser Gly Asn Cys Asp Val Val Ile Gly 1100 1105 1110		
Ile Ile Asn Asn Thr Val Tyr Asp Pro Leu Gln Pro Glu Leu Asp 1115 1120 1125		
Ser Phe Lys Glu Glu Leu Asp Lys Tyr Phe Lys Asn His Thr Ser 1130 1135 1140		



Pro Asp Val Asp Leu Gly Asp Ile Ser Gly Ile Asn Ala Ser Val  
1145 1150 1155

Val Asn Ile Gln Lys Glu Ile Asp Arg Leu Asn Glu Val Ala Lys  
1160 1165 1170

Asn Leu Asn Glu Ser Leu Ile Asp Leu Gln Glu Leu Gly Lys Tyr  
1175 1180 1185

Glu Gln Tyr Ile Lys Trp Pro Trp Tyr Val Trp Leu Gly Phe Ile  
1190 1195 1200

Ala Gly Leu Ile Ala Ile Val Met Val Thr Ile Leu Leu Cys Cys  
1205 1210 1215

Met Thr Ser Cys Cys Ser Cys Leu Lys Gly Ala Cys Ser Cys Gly  
1220 1225 1230

Ser Cys Cys Lys Phe Asp Glu Asp Asp Ser Glu Pro Val Leu Lys  
1235 1240 1245

Gly Val Lys Leu His Tyr Thr  
1250 1255

<210> 5  
<211> 588  
<212> DNA  
<213> SARS coronavirus

<220>  
<221> CDS  
<222> (1)..(588)

<400> 5  
ttg aac cag ctt gag agc aaa gtt tct ggt aaa ggc caa caa caa caa 48  
Leu Asn Gln Leu Glu Ser Lys Val Ser Gly Lys Gly Gln Gln Gln Gln  
1 5 10 15  
ggc caa act gtc act aag aaa tct gct gct gag gca tct aaa aag cct 96  
Gly Gln Thr Val Thr Lys Lys Ser Ala Ala Glu Ala Ser Lys Lys Pro  
20 25 30  
cgc caa aaa cgt act gcc aca aaa cag tac aac gtc act caa gca ttt 144  
Arg Gln Lys Arg Thr Ala Thr Lys Gln Tyr Asn Val Thr Gln Ala Phe  
35 40 45

ggg aga cgt ggt cca gaa caa acc caa gga aat ttc ggg gac caa gac 192  
 Gly Arg Arg Gly Pro Glu Gln Thr Gln Gly Asn Phe Gly Asp Gln Asp  
 50 55 60  
 cta atc aga caa gga act gat tac aaa cat tgg ccg caa att gca caa 240  
 Leu Ile Arg Gln Gly Thr Asp Tyr Lys His Trp Pro Gln Ile Ala Gln  
 65 70 75 80  
 ttt gct cca agt gcc tct gca ttc ttt gga atg tca cgc att ggc atg 288  
 Phe Ala Pro Ser Ala Ser Ala Phe Phe Gly Met Ser Arg Ile Gly Met  
 85 90 95  
 gaa gtc aca cct tcg gga aca tgg ctg act tat cat gga gcc att aaa 336  
 Glu Val Thr Pro Ser Gly Thr Trp Leu Thr Tyr His Gly Ala Ile Lys  
 100 105 110  
 ttg gat gac aaa gat cca caa ttc aaa gac aac gtc ata ctg ctg aac 384  
 Leu Asp Asp Lys Asp Pro Gln Phe Lys Asp Asn Val Ile Leu Leu Asn  
 115 120 125  
 aag cac att gac gca tac aaa aca ttc cca cca aca gag cct aaa aag 432  
 Lys His Ile Asp Ala Tyr Lys Thr Phe Pro Pro Thr Glu Pro Lys Lys  
 130 135 140  
 gac aaa aag aaa aag act gat gaa gct cag cct ttg ccg cag aga caa 480  
 Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro Leu Pro Gln Arg Gln  
 145 150 155 160  
 aag aag cag ccc act gtg act ctt ctt cct gcg gct gac atg gat gat 528  
 Lys Lys Gln Pro Thr Val Thr Leu Leu Pro Ala Ala Asp Met Asp Asp  
 165 170 175  
 ttc tcc aga caa ctt caa aat tcc atg agt gga gct tct gct gat tca 576  
 Phe Ser Arg Gln Leu Gln Asn Ser Met Ser Gly Ala Ser Ala Asp Ser  
 180 185 190  
 act cag gca taa 588  
 Thr Gln Ala  
 195

<210> 6  
 <211> 195  
 <212> PRT  
 <213> SARS coronavirus

<400> 6

Leu Asn Gln Leu Glu Ser Lys Val Ser Gly Lys Gly Gln Gln Gln Gln  
 1 5 10 15

Gly Gln Thr Val Thr Lys Lys Ser Ala Ala Glu Ala Ser Lys Lys Pro  
 20 25 30

Arg Gln Lys Arg Thr Ala Thr Lys Gln Tyr Asn Val Thr Gln Ala Phe  
 35 40 45

Gly Arg Arg Gly Pro Glu Gln Thr Gln Gly Asn Phe Gly Asp Gln Asp  
 50 55 60

Leu Ile Arg Gln Gly Thr Asp Tyr Lys His Trp Pro Gln Ile Ala Gln  
 65 70 75 80

Phe Ala Pro Ser Ala Ser Ala Phe Phe Gly Met Ser Arg Ile Gly Met  
 85 90 95

Glu Val Thr Pro Ser Gly Thr Trp Leu Thr Tyr His Gly Ala Ile Lys  
 100 105 110

Leu Asp Asp Lys Asp Pro Gln Phe Lys Asp Asn Val Ile Leu Leu Asn  
 115 120 125

Lys His Ile Asp Ala Tyr Lys Thr Phe Pro Pro Thr Glu Pro Lys Lys  
 130 135 140

Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro Leu Pro Gln Arg Gln  
 145 150 155 160

Lys Lys Gln Pro Thr Val Thr Leu Leu Pro Ala Ala Asp Met Asp Asp  
 165 170 175

Phe Ser Arg Gln Leu Gln Asn Ser Met Ser Gly Ala Ser Ala Asp Ser  
 180 185 190

Thr Gln Ala  
 195

<210> 7  
 <211> 684  
 <212> DNA  
 <213> SARS coronavirus

<220>  
 <221> CDS  
 <222> (1)..(684)

&lt;400&gt; 7

agg tat ctt aga cat ggc aag ctt agg ccc ttt gag aga gac ata tct	48
Arg Tyr Leu Arg His Gly Lys Leu Arg Pro Phe Glu Arg Asp Ile Ser	
1 5 10 15	
aat gtg cct ttc tcc cct gat ggc aaa cct tgc acc cca cct gct ctt	96
Asn Val Pro Phe Ser Pro Asp Gly Lys Pro Cys Thr Pro Pro Ala Leu	
20 25 30	
aat tgt tat tgg cca tta aat gat tat ggt ttt tac acc act act ggc	144
Asn Cys Tyr Trp Pro Leu Asn Asp Tyr Gly Phe Tyr Thr Thr Thr Gly	
35 40 45	
att ggc tac caa cct tac aga gtt gta gta ctt tct ttt gaa ctt tta	192
Ile Gly Tyr Gln Pro Tyr Arg Val Val Val Leu Ser Phe Glu Leu Leu	
50 55 60	
aat gca ccg gcc acg gtt tgt gga cca aaa tta tcc act gac ctt att	240
Asn Ala Pro Ala Thr Val Cys Gly Pro Lys Leu Ser Thr Asp Leu Ile	
65 70 75 80	
aag aac cag tgt gtc aat ttt aat ttt aat gga ctc act ggt act ggt	288
Lys Asn Gln Cys Val Asn Phe Asn Phe Asn Gly Leu Thr Gly Thr Gly	
85 90 95	
gtg tta act cct tct tca aag aga ttt caa cca ttt caa caa ttt ggc	336
Val Leu Thr Pro Ser Ser Lys Arg Phe Gln Pro Phe Gln Gln Phe Gly	
100 105 110	
cgt gat gtt tct gat ttc act gat tcc gtt cga gat cct aaa aca tct	384
Arg Asp Val Ser Asp Phe Thr Ser Val Arg Asp Pro Lys Thr Ser	
115 120 125	
gaa ata tta gac att tca cct tgc tct ttt ggg ggt gta agt gta att	432
Glu Ile Leu Asp Ile Ser Pro Cys Ser Phe Gly Gly Val Ser Val Ile	
130 135 140	
aca cct gga aca aat gct tca tct gaa gtt gct gtt cta tat caa gat	480
Thr Pro Gly Thr Asn Ala Ser Ser Glu Val Ala Val Leu Tyr Gln Asp	
145 150 155 160	
gtt aac tgc act gat gtt tct aca gca att cat gca gat caa ctc aca	528
Val Asn Cys Thr Asp Val Ser Thr Ala Ile His Ala Asp Gln Leu Thr	
165 170 175	
cca gct tgg cgc ata tat tct act gga aac aat gta ttc cag act caa	576
Pro Ala Trp Arg Ile Tyr Ser Thr Gly Asn Asn Val Phe Gln Thr Gln	
180 185 190	
gca ggc tgt ctt ata gga gct gag cat gtc gac act tct tat gag tgc	624
Ala Gly Cys Leu Ile Gly Ala Glu His Val Asp Thr Ser Tyr Glu Cys	
195 200 205	
gac att cct att gga gct ggc att tgt gct agt tac cat aca gtt tct	672
Asp Ile Pro Ile Gly Ala Gly Ile Cys Ala Ser Tyr His Thr Val Ser	

210 215 220 684

tta tta cgt agt  
 Leu Leu Arg Ser  
 225

<210> 8  
 <211> 228  
 <212> PRT  
 <213> SARS coronavirus

<400> 8

Arg Tyr Leu Arg His Gly Lys Leu Arg Pro Phe Glu Arg Asp Ile Ser  
 1 5 10 15

Asn Val Pro Phe Ser Pro Asp Gly Lys Pro Cys Thr Pro Pro Ala Leu  
 20 25 30

Asn Cys Tyr Trp Pro Leu Asn Asp Tyr Gly Phe Tyr Thr Thr Thr Gly  
 35 40 45

Ile Gly Tyr Gln Pro Tyr Arg Val Val Val Leu Ser Phe Glu Leu Leu  
 50 55 60

Asn Ala Pro Ala Thr Val Cys Gly Pro Lys Leu Ser Thr Asp Leu Ile  
 65 70 75 80

Lys Asn Gln Cys Val Asn Phe Asn Phe Asn Gly Leu Thr Gly Thr Gly  
 85 90 95

Val Leu Thr Pro Ser Ser Lys Arg Phe Gln Pro Phe Gln Gln Phe Gly  
 100 105 110

Arg Asp Val Ser Asp Phe Thr Asp Ser Val Arg Asp Pro Lys Thr Ser  
 115 120 125

Glu Ile Leu Asp Ile Ser Pro Cys Ser Phe Gly Gly Val Ser Val Ile  
 130 135 140

Thr Pro Gly Thr Asn Ala Ser Ser Glu Val Ala Val Leu Tyr Gln Asp  
 145 150 155 160

Val Asn Cys Thr Asp Val Ser Thr Ala Ile His Ala Asp Gln Leu Thr

165

170

175

Pro Ala Trp Arg Ile Tyr Ser Thr Gly Asn Asn Val Phe Gln Thr Gln  
 180 185 190

Ala Gly Cys Leu Ile Gly Ala Glu His Val Asp Thr Ser Tyr Glu Cys  
 195 200 205

Asp Ile Pro Ile Gly Ala Gly Ile Cys Ala Ser Tyr His Thr Val Ser  
 210 215 220

Leu Leu Arg Ser  
 225

<210> 9  
 <211> 29711  
 <212> DNA  
 <213> SARS coronavirus

<400> 9  
 taccaggaa aagccaacca acctcgatct cttgtagatc tgttctctaa acgaacttta 60  
 aaatctgtgt agctgtcgct cggctgcatg cctagtgcac ctacgcagta taaacaataa 120  
 taaattttac tgtcgttgac aagaaacgag taactcgtcc ctcttctgca gactgcttac 180  
 ggtttctgccc gtgttgacgt cgatcatcag catacctagg tttcgtccgg gtgtgaccga 240  
 aaggtaagat ggagagcctt gttcttggtg tcaacgagaa aacacacgtc caactcagtt 300  
 tgcctgtcct tcagggttaga gacgtgctag tgcgtggcct cggggactct gtggaagagg 360  
 ccctatcgga ggcacgtgaa cacctcaaaa atggcacttg tggcttagta gagctggaaa 420  
 aaggcgtact gcccagctt gaacagccct atgtgttcat taaacgttct gatgccttaa 480  
 gcaccaatca cggccacaag gtcgttgagc tgggtgcaga aatggacggc attcagtagc 540  
 gtcgtagcgg tataaactg ggagtactcg tgccacatgt gggcgaaacc ccaattgcat 600  
 accgcaatgt tcttcttcgt aagaacggta ataaggagc cggtggtcat agctatggca 660  
 tcgatctaaa gtcttatgac ttaggtgacg agcttggcac tgatccatt gaagattatg 720  
 aacaaaactg gaacactaag catggcagtg gtgcactccg tgaactcact cgtgagctca 780  
 atggaggtgc agtcactcgc tatgtcgaca acaatttctg tggcccagat gggtagcctc 840  
 ttgattgcat caaagatttt ctgcacgacg cgggcaagtc aatgtgcact ctttccgaac 900

aacttgatta catcgagtcg aagagaggtg tctactgctg ccgtgaccat gagcatgaaa	960
ttgcctgggt cactgagcgc tctgataaga gctacgagca ccagacaccc ttcgaaatta	1020
agagtgccaa gaaatttgac actttcaaag gggaaatgcc aaagtttgtg tttcctctta	1080
actcaaaagt caaagtcatt caaccacgtg ttgaaaagaa aaagactgag ggtttcatgg	1140
ggcgtatacg ctctgtgtac cctgttgcac ctccacagga gtgtaacaat atgcacttgt	1200
ctaccttgat gaaatgtaat cattgcatg aagtttcatg gcagacgtgc gactttctga	1260
aagccacttg tgaacattgt ggcaactgaaa atttagttat tgaaggacct actacatgtg	1320
ggtacctacc tactaatgct gtagtgaaaa tgccatgtcc tgccgtgcaa gaccagaga	1380
ttggacctga gcatagtgtt gcagattatc acaaccactc aaacattgaa actcgactcc	1440
gcaagggagg taggactaga tgttttgagg gctgtgtgtt tgccatgtt ggctgtata	1500
ataagcgtgc ctactgggtt cctcgtgcta gtgctgatat tggctcaggc catactggca	1560
ttactgggtga caatgtggag accttgaatg aggatctcct tgagatactg agtcgtgaac	1620
gtgttaacat taacattgtt ggcgattttc atttgaatga agaggttgcc atcatttttg	1680
catctttctc tgcttctaca agtgccttta ttgacactat aaagagtctt gattacaagt	1740
ctttcaaaac cattgttgag tcctgcggtg actataaagt taccaagga aagcccgtaa	1800
aaggtgcttg gaacattgga caacagagat cagttttaac accactgtgt ggttttcct	1860
cacaggctgc tgggtgttatc agatcaattt ttgcgcgcac acttgatgca gcaaaccact	1920
caattcctga tttgcaaaga gcagctgtca ccatacttga tggatattct gaacagtc	1980
tacgtcttgt cgacgccatg gtttatactt cagacctgct caccaacagt gtcattatta	2040
tggcatatgt aactgggtgt cttgtacaac agacttctca gtgggtgtct aatcttttgg	2100
gcactactgt tgaaaaactc aggcctatct ttgaatggat tgaggcgaaa cttagtgcag	2160
gagttgaatt tctcaaggat gcttgggaga ttctcaaatt tctcattaca ggtgtttttg	2220
acatcgtcaa gggtaaata caggttgctt cagataacat caaggattgt gtaaaatgct	2280
tcattgatgt tgtaacaag gcactcgaaa tgtgcattga tcaagtcact atcgctggcg	2340
caaagttgcg atcactcaac ttaggtgaag tcttcatcgc tcaaagcaag ggactttacc	2400
gtcagtgtat acgtggcaag gagcagctgc aactactcat gcctcttaag gcacaaaag	2460
aagtaacctt tcttgaagg gattcacatg acacagtact tacctctgag gaggttgttc	2520
tcaagaacgg tgaactcgaa gcactcgaga cgcccgttga tagcttcaca aatggagcta	2580

tcgttggcac accagtctgt gtaaattggcc tcatgctctt agagattaag gacaaagaac	2640
aatactgcgc attgtctcct ggtttactgg ctacaaacaa tgtctttcgc ttaaaagggg	2700
gtgcaccaat taaagggtga acctttggag aagatactgt ttgggaagtt caagggttaca	2760
agaatgtgag aatcacattt gagcttgatg aacgtgttga caaagtgcctt aatgaaaagt	2820
gctctgtcta cactgttgaa tccggtaccg aagttactga gtttgcatgt gttgtagcag	2880
aggctgttgt gaagacttta caaccagttt ctgatctcct taccaacatg ggtattgatc	2940
ttgatgagtg gagtgtagct acattctact tatttgatga tgctggtgaa gaaaactttt	3000
catcacgtat gtattgttcc ttttaccctc cagatgagga agaagaggac gatgcagagt	3060
gtgaggaaga agaaattgat gaaacctgtg aacatgagta cggtagacag gatgattatc	3120
aagggtctccc tctggaattt ggtgcctcag ctgaaacagt tcgagttgag gaagaagaag	3180
aggaagactg gctggatgat actactgagc aatcagagat tgagccagaa ccagaaccta	3240
cacctgaaga accagttaat cagtttactg gttattttaa acttactgac aatggttgcca	3300
ttaaattgtgt tgacatcggt aaggaggcac aaagtgctaa tcctatgggtg attgtaaattg	3360
ctgctaacat acacctgaaa catgggtggtg gtgtagcagg tgcactcaac aaggcaacca	3420
atggtgccat gcaaaaggag agtgatgatt acattaagct aaatggccct cttacagtag	3480
gagggctcttg tttgctttct ggacataatc ttgctaagaa gtgtctgcat gttggtggac	3540
ctaacctaaa tgcagggtgag gacatccagc ttcttaaggc agcatatgaa aatttcaatt	3600
cacaggacat cttacttgca ccattgttgt cagcaggcat atttggtgct aaaccacttc	3660
agtctttaca agtgtgcgtg cagacgggtc gtacacaggt ttatattgca gtcaatgaca	3720
aagctcttta tgagcagggt gtcattggatt atcttgataa cctgaagcct agagtggaag	3780
cacctaaaca agaggagcca ccaaacacag aagattccaa aactgaggag aaatctgtcg	3840
tacagaagcc tgtcgatgtg aagccaaaaa ttaaggcctg cattgatgag gttaccacaa	3900
cactggaaga aactaagttt cttaccaata agttactctt gtttgctgat atcaatggta	3960
agctttacca tgattctcag aacatgctta gaggtgaaga tatgtctttc cttgagaagg	4020
atgcacctta catggtaggt gatgttatca ctagtgggtga tatcacttgt gttgtaatac	4080
cctccaaaaa ggctgggtggc actactgaga tgctctcaag agctttgaag aaagtgccag	4140
ttgatgagta tataaccacg taccctggac aaggatgtgc tggttataca cttgaggaag	4200



ctaagactgc tcttaagaaa tgcaaatctg cattttatgt actacettca gaagcaccta 4260  
 atgctaagga agagattcta ggaactgtat cctggaattt gagagaaatg cttgctcatg 4320  
 ctgaagagac aagaaaatta atgcctatat gcatggatgt tagagccata atggcaacca 4380  
 tccaacgtaa gtataaagga attaaaattc aagagggcat cgttgactat ggtgtccgat 4440  
 tcttctttta tactagtaaa gagcctgtag cttctattat tacgaagctg aactctctaa 4500  
 atgagccgct tgtcacaatg ccaattgggt atgtgacaca tggttttaat cttgaagagg 4560  
 ctgcgcgctg tatgcgttct cttaaagctc ctgccgtagt gtcagtatca tcaccagatg 4620  
 ctgttactac atataatgga tacctcactt cgtcacaaa gacatctgag gagcactttg 4680  
 tagaaacagt ttctttggct ggctcttaca gagattggtc ctattcagga cagcgtagag 4740  
 agttaggtgt tgaatttctt aagcgtgggtg acaaaattgt gtaccacact ctggagagcc 4800  
 ccgtcgagtt tcatcttgac ggtgaggttc tttcacttga caaactaaag agtctcttat 4860  
 ccctgcggga ggttaagact ataaaagtgt tcacaactgt ggacaacact aatctccaca 4920  
 cacagcttgt ggatatgtct atgacatatg gacagcagtt tggccaaca tacttgatg 4980  
 gtgctgatgt tacaaaaatt aaacctcatg taaatcatga gggtaagact ttctttgtac 5040  
 tacctagtga tgacacacta cgtagtgaag ctttcgagta ctaccatact cttgatgaga 5100  
 gttttcttgg taggtacatg tctgctttta accacacaaa gaaatggaaa tttcctcaag 5160  
 ttgggtggttt aacttcaatt aaatgggctg ataacaattg ttatttgtct agtgttttat 5220  
 tagcacttca acagcttgaa gtcaaattca atgcaccagc acttcaagag gcttattata 5280  
 gagcccgtgc tggatgatgt gctaactttt gtgcactcat actcgcttac agtaataaaa 5340  
 ctggtggcga gcttggatgt gtcagagaaa ctatgacca tcttctacag catgctaatt 5400  
 tggaaatctgc aaagcgagtt cttaatgtgg tgtgtaaaca ttgtggtcag aaaactacta 5460  
 ccttaacggg tgtagaagct gtgatgtata tgggtactct atcttatgat aatcttaaga 5520  
 caggtgtttc cattccatgt gtgtgtggtc gtgatgctac acaatatcta gtacaacaag 5580  
 agtcttcttt tgttatgatg tctgcaccac ctgctgagta taaattacag caaggtagat 5640  
 tcttatgtgc gaatgagtac actggtaact atcagtgtgg tcattacact catataactg 5700  
 ctaaggagac cctctatcgt attgacggag ctcaccttac aaagatgtca gagtacaaag 5760  
 gaccagtgc tgatgttttc tacaaggaaa catcttacac tacaaccatc aagcctgtgt 5820  
 cgtataaact cgatggagtt acttacacag agattgaacc aaaattggat ggggtattata 5880

aaaaggataa tgcttactat acagagcagc ctatagacct tgtaccaact caaccattac	5940
caaatgcgag ttttgataat ttcaaactca catgttctaa cacaaaattt gctgatgatt	6000
taaatcaaat gacaggett c acaaagccag cttcacgaga gctatctgtc acattcttcc	6060
cagacttgaa tggcgatgta gtggctattg actatagaca ctattcagcg agtttcaaga	6120
aaggtgctaa attactgcat aagccaattg tttggcacat taaccaggct acaaccaaga	6180
caacgttcaa accaaacact tgggtgtttac gttgtctttg gagtacaaag ccagtagata	6240
cttcaaattc atttgaagtt ctggcagtag aagacacaca aggaatggac aatcttgctt	6300
gtgaaagtca acaaccacc tctgaagaag tagtggaata tcctaccata cagaaggaag	6360
tcatagagtg tgacgtgaaa actaccgaag ttgtaggcaa tgtcatactt aaaccatcag	6420
atgaagggtg taaagtaaca caagagttag gtcatgagga tcttatggct gcttatgtgg	6480
aaaacacaag cattaccatt aagaaaccta atgagctttc actagcctta ggtttaaaaa	6540
caattgccac tcatgggtatt gctgcaatta atagtgttcc ttggagtaaa attttggtt	6600
atgtcaaacc attcttagga caagcagcaa ttacaacatc aaattgcgct aagagattag	6660
cacaacgtgt gtttaacaat tatatgcctt atgtgtttac attattgttc caattgtgta	6720
cttttactaa aagtaccaat tctagaatta gagcttccact acctacaact attgctaaaa	6780
atagtgttaa gagtgttgct aaattatgtt tggatgccgg cattaattat gtgaagtcac	6840
ccaaattttc taaattgttc acaatcgcta tgtggctatt gttgttaagt atttgcttag	6900
gttctctaata ctgtgtaact gctgcttttg gtgtactctt atctaatttt ggtgctcctt	6960
cttattgtaa tggcgttaga gaattgtatc ttaattcgtc taacgttact actatggatt	7020
tctgtgaagg ttcttttcct tgcagcattt gtttaagtgg attagactcc cttgattctt	7080
atccagctct tgaaaccatt caggtgacga tttcatcgta caagctagac ttgacaattt	7140
taggtctggc cgctgagtg gttttggcat atatgttggt cacaaaattc ttttatattat	7200
taggtctttc agctataatg caggtgttct ttggctatct tgctagtcat ttcacagca	7260
attcttggct catgtggttt atcattagta ttgtacaaat ggcaccggt tctgcaatgg	7320
ttaggatgta catcttcttt gcttctttct actacatatg gaagagctat gttcatatca	7380
tggatgggtg cacctcttcg acttgcatga tgtgctataa gcgcaatcgt gccacacg	7440
ttgagtgtac aactattgtt aatggcatga agagatcttt ctatgtctat gcaaattggag	7500

gccgtggcctt ctgcaagact cacaattgga attgtctcaa ttgtgacaca ttttgactg	7560
gtagtacatt cattagtgat gaagttgtc gtgatttgtc actccagttt aaaagaccaa	7620
tcaaccctac tgaccagtca tcgtatattg ttgatagtgt tgctgtgaaa aatggcgcg	7680
ttcacctcta ctttgacaag gctgggtcaaa agacctatga gagacatccg ctctcccatt	7740
ttgtcaattt agacaatttg agagctaaca aactaaagg ttactgcct attaatgtca	7800
tagtttttgà tggcaagtcc aaatgcgacg agtctgtctc taagtctgct tctgtgtact	7860
acagtcagct gatgtgcaa cctattctgt tgcttgacca agctcttgta tcagacgttg	7920
gagatagtag tgaagtttcc gtttaagatgt ttgatgctta tgtcgacacc ttttcagcaa	7980
cttttagtgt tcctatggaa aaacttaagg cacttggtgc tacagctcac agcgagttag	8040
caaaggggtgt agctttagat ggtgtccttt ctacattcgt gtcagctgcc cgacaagggtg	8100
ttgttgatac cgatgttgac acaaaggatg ttattgaatg tctcaaactt tcacatcact	8160
ctgacttaga agtgacaggt gacagttgta acaatttcat gtcacctat aataagggtg	8220
aaaacatgac gccagagat cttggcgcat gtattgactg taatgcaagg catatcaatg	8280
cccaagtagc aaaaagtcac aatgtttcac tcactctggaa tgtaaaagac tacatgtctt	8340
tatctgaaca gctgcgtaaa caaattcgta gtgctgcaa gaagaacaac atacctttta	8400
gactaacttg tgctacaact agacagggtg tcaatgtcat aactactaaa atctcactca	8460
aggggtggtaa gattgttagt acttgtttta aacttatgct taaggccaca ttattgtgcg	8520
ttcttgctgc attggtttgt tatatcgta tgccagtaca tacattgtca atccatgatg	8580
gttacacaaa tgaaatcatt gggtacaaag ccattcagga tgggtgtcact cgtgacatca	8640
tttctactga tgattgtttt gcaataaac atgctggttt tgacgcatgg tttagccagc	8700
gtgggtggttc atacaaaaat gacaaaagct gccctgtagt agctgctatc attacaagag	8760
agattggttt catagtgcct ggcttaccgg gtactgtgct gagagcaatc aatgggtgact	8820
tcttgcatth tctacctcgt gtttttagtg ctgttggtcaa catttgctac acaccttcca	8880
aactcattga gtatagtgat tttgctacct ctgcttgctg tcttgctgct gagtgtaaa	8940
tttttaagga tgctatgggc aaacctgtgc catattgtta tgacactaat ttgctagagg	9000
gttctatttc ttatagtgag ctctgtccag acactcgta tggtgcttatg gatgggtcca	9060
tcatacagtt tcctaacact taactggagg gttctgttag agtagtaaca acttttgatg	9120
ctgagtactg tagacatggt acatgcgaaa gggtcagaagt aggtatttgc ctatctacca	9180

gtggtagatg gggtcttaat aatgagcatt acagagctct atcaggagtt ttctgtggtg 9240  
 ttgatgcgat gaatctcata gctaacatct ttactcctct tgtgcaacct gtgggtgctt 9300  
 tagatgtgtc tgcttcagta gtggctgggtg gtattattgc catattgggtg acttgtgctg 9360  
 cctactactt tatgaaattc agacgtgttt ttggtgagta caaccatgtt gttgctgcta 9420  
 atgcactttt gttttttagt tctttcacta tactctgtct ggtaccagct tacagctttc 9480  
 tgccgggagt ctactcagtc ttttacttgt acttgacatt ctatttcacc aatgatgttt 9540  
 cattcttggc tcaccttcaa tggtttgcca tgttttctcc tattgtgcct ttttgataa 9600  
 cagcaatcta tgtattctgt atttctctga agcactgcca ttggttcttt aacaactatc 9660  
 ttaggaaaag agtcatgttt aatggagtta catttagtac cttegaggag gctgctttgt 9720  
 gtaccttttt gctcaacaag gaaatgtacc taaaattgcg tagcgagaca ctgttgccac 9780  
 ttacacagta taacaggtat cttgctctat ataacaagta caagtatttc agtggagcct 9840  
 tagatactac cagctatcgt gaagcagctt gctgccactt agcaaaggct ctaaatagact 9900  
 ttagcaactc aggtgctgat gttctctacc aaccaccaca gacatcaatc acttctgctg 9960  
 ttctgcagag tggtttttagg aaaatggcat tcccgtcagg caaagttgaa ggggtgcatgg 10020  
 tacaagtaac ctgtggaact acaactctta atggattgtg gttggatgac acagtatact 10080  
 gtccaagaca tgtcatttgc acagcagaag acatgcttaa tcttaactat gaagatctgc 10140  
 tcattcgcaa atccaaccat agctttcttg ttcaggctgg caatgttcaa cttegtgtta 10200  
 ttggccattc tatgcaaaat tgtctgctta ggcttaaagt tgatacttct aaccctaaga 10260  
 caccaagta taaatttgtc cgtatccaac ctggtcaaac attttcagtt ctagcatgct 10320  
 acaatggttc accatctggt gtttatcagt gtgccatgag acctaatcat accattaaag 10380  
 gttctttcct taatggatca tgtggtagtgt ttggttttaa cattgattat gattgcgtgt 10440  
 ctttctgcta tatgcatcat atggagcttc caacaggagt acacgctggg actgacttag 10500  
 aaggtaaatt ctatggtcca tttgttgaca gacaaactgc acaggctgca ggtacagaca 10560  
 caaccataac attaaatgtt ttggcatggc tgtatgctgc tgttatcaat ggtgataggt 10620  
 ggtttcttaa tagattcacc actactttga atgactttta ccttgtggca atgaagtaca 10680  
 actatgaacc tttgacacaa gatcatgttg acatattggg acctctttct gctcaaacag 10740  
 gaattgccgt cttagatatg tgtgctgctt tgaaagagct gctgcagaat ggtatgaatg 10800

gtcgtactat ccttggttagc actattttag aagatgagtt tacaccattt gatgttggtta 10860  
 gacaatgctc tgggtgttacc ttccaaggta agttcaagaa aattgttaag ggcactcatc 10920  
 attggatgct ttttaactttc ttgacatcac tattgattct tgttcaaagt acacagtggc 10980  
 cactgttttt ctttgtttac gagaatgctt tcttgccatt tactcttggc attatggcaa 11040  
 ttgctgcatg tgctatgctg cttgttaagc ataagcacgc attcttgtgc ttgtttctgt 11100  
 taccttctct tgcaacagtt gcttacttta atatggctca catgcctgct agctgggtga 11160  
 tgcgtatcat gacatggctt gaattggctg acactagctt gtctggttat aggcttaagg 11220  
 attgtgttat gtatgcttca gctttagttt tgcttattct catgacagct cgcactgttt 11280  
 atgatgatgc tgctagacgt gtttggacac tgatgaatgt cattacactt gtttaciaag 11340  
 tctactatgg taatgcttta gatcaagcta tttccatgtg ggccttagtt atttctgtaa 11400  
 cctctaacta ttctgggtgc gttacgacta tcatgttttt agctagagct atagtgtttg 11460  
 tgtgtgttga gtattaccca ttgttattta ttactggcaa caccttacag tgtatcatgc 11520  
 ttgtttattg tttcttaggc tattgttgct gctgctactt tggccttttc tgtttactca 11580  
 accgttactt caggcttact cttgggtgtt atgactactt ggtctctaca caagaattta 11640  
 ggtatatgaa ctcccagggg cttttgcctc ctaagagtag tattgatgct ttcaagctta 11700  
 acattaagtt gttgggtatt ggaggtaaac catgtatcaa ggttgctact gtacagtcta 11760  
 aaatgtctga cgtaaagtgc acatctgtgg tactgctctc ggttcttcaa caacttagag 11820  
 tagagtcac ttctaaattg tgggcacaa gtgtacaact ccacaatgat attcttcttg 11880  
 caaaagacac aactgaagct ttcgagaaga tgggttctct tttgtctgtt ttgctatcca 11940  
 tgcagggtgc tgtagacatt aatagggtgt gcgaggaaat gctcgataac cgtgctactc 12000  
 ttcaggctat tgcttcagaa tttagttctt taccatcata tgccgcttat gccactgccc 12060  
 aggaggccta tgagcaggct gtagctaatg gtgattctga agtcgttctc aaaaagttaa 12120  
 agaaatcttt gaatgtggct aaatctgagt ttgaccgtga tgctgccatg caacgcaagt 12180  
 tggaaaagat ggcagatcag gctatgacct aaatgtacaa acaggcaaga tctgaggaca 12240  
 agagggcaaa agtaactagt gctatgcaaa caatgctctt cactatgctt aggaagcttg 12300  
 ataatgatgc acttaacaac attatcaaca atgcgcgtga tggttgtgtt ccactcaaca 12360  
 tcataccatt gactacagca gccaaactca tggttgtgtt ccctgattat ggtacctaca 12420  
 agaacacttg tgatggtaac acctttacat atgcatctgc actctgggaa atccagcaag 12480

ttgttgatgc ggatagcaag attgttcaac ttagtgaaat taacatggac aattcaccaa 12540  
 atttggcttg gcctcttatt gttacagctc taagagccaa ctgagctggt aaactacaga 12600  
 ataatgaact gagtccagta gcactacgac agatgtcctg tgcggctggt accacacaaa 12660  
 cagcttgtag tgatgacaat gcacttgcct actataacaa ttcgaaggga ggtaggtttg 12720  
 tgctggcatt actatcagac caccaagatc tcaaattggc tagattccct aagagtgatg 12780  
 gtacaggtag aatttacaca gaactggaac caccttgtag gtttgttaca gacacaccaa 12840  
 aagggcctaa agtgaaatac ttgtacttca tcaaaggcct aaacaaccta aatagaggta 12900  
 tgggtgctggg cagtttagct gctacagtag gtcttcaggc tggaaatgct acagaagtag 12960  
 ctgccaatc aactgtgctt tccttctgtg cttttgcagt agaccctgct aaagcatata 13020  
 aggattacct agcaagtgga ggacaaccaa tcaccaactg tgtgaagatg ttgtgtacac 13080  
 aactggtag aggacaggca attactgtaa caccagaagc taacatggac caagagtcct 13140  
 ttgggtggtgc ttcatgttgt ctgtattgta gatgccacat tgaccatcca aatcctaaag 13200  
 gattctgtga cttgaaagggt aagtacgtcc aaatacctac cacttgtgct aatgaccag 13260  
 tgggttttac acttagaaac acagtctgta ccgtctgcgg aatgtggaaa gggtatggct 13320  
 gtagttgtga ccaactccgc gaacccttga tgcagtctgc ggatgcatca acgtttttta 13380  
 acgggtttgc ggtgtaagtg cagcccgtct tacaccgtgc ggcacaggca ctagtactga 13440  
 tgctgtctac agggcttttg atatttaca cgaaaaagtt gctgggtttg caaagttcct 13500  
 aaaaactaat tgctgtcgt tccaggagaa ggatgaggaa ggcaatttat tagactctta 13560  
 cttttagatt aagaggcata ctatgtctaa ctaccaacat gaagagacta ttataactt 13620  
 ggtaaagat tgtccagcgg ttgctgtcca tgactttttc aagtttagag tagatggtag 13680  
 catggtacca catatatcac gtcagcgtct aactaaatac acaatggctg atttagtcta 13740  
 tgctctacgt cttttgatg agggtaattg tgatacatta aaagaaatac tcgtcacata 13800  
 caattgctgt gatgatgatt atttcaataa gaaggattgg tatgacttcg tagagaatcc 13860  
 tgacatctta cgcgtatatg ctaacttagg tgagcgtgta cgccaatcat tattaagac 13920  
 tgtacaattc tgcgatgcta tgcgtgatgc aggcattgta ggcgtactga cattagataa 13980  
 tcaggatctt aatgggaact ggtacgattt cgggtgatttc gtacaagtag caccaggctg 14040  
 cggagttcct attgtggatt catattactc attgctgatg cccatcctca ctttgactag 14100

ggcattggct gctgagtcctc atatggatgc tgatctcgca aaaccactta ttaagtggga 14160  
tttgctgaaa tatgatttta cggaagagag actttgtctc ttcgaccgtt attttaaata 14220  
ttgggaccag acataccatc ccaattgtat taactgtttg gatgatagggt gtatccttca 14280  
ttgtgcaaac tttaatgtgt tattttctac tgtgtttcca cctacaagtt ttggaccact 14340  
agtaagaaaa atattttag atgggtgtcc ttttgttgtt tcaactggat accattttcg 14400  
tgagtttaga gtcgtacata atcaggatgt aaacttacat agctcgcgtc tcagtttcaa 14460  
ggaactttta gtgtatgctg ctgatccagc tatgcatgca gcttctggca atttattgct 14520  
agataaacgc actacatgct tttcagtagc tgcactaaca aacaatgttg cttttcaaac 14580  
tgtcaaaccg ggtaatttta ataaagactt ttatgacttt gctgtgtcta aaggtttctt 14640  
taaggaagga agttctgttg aactaaaaca cttcttcttt gctcaggatg gcaacgctgc 14700  
tatcagtgat tatgactatt atcggtataa tctgccaaca atgtgtgata tcagacaact 14760  
cctattcgta gttgaagttg ttgataaata ctttgattgt tacgatgggtg gctgtattaa 14820  
tgccaaccaa gtaatcgta acaatctgga taaatcagct ggtttcccat ttaataaatg 14880  
gggtgaaggct agactttatt atgactcaat gagttatgag gatcaagatg cacttttcgc 14940  
gtatactaag cgtaatgtca tccctactat aactcaaag aatcttaagt atgccattag 15000  
tgcaaagaat agagctcgca ccgtagctgg tgtctctatc tgtagtacta tgacaaatag 15060  
acagtttcat cagaaattat tgaagtcaat agccgccact agaggagcta ctgtggtaat 15120  
tggaacaagc aagttttacg gtggctggca taatatgtta aaaactgttt acagtgatgt 15180  
agaaactcca caccttatgg gttgggatta tccaaaatgt gacagagcca tgcctaacat 15240  
gcttaggata atggcctctc ttgttcttgc tcgcaaacat aacacttgct gtaacttctc 15300  
acaccgtttc tacaggttag ctaacgagtg tgcgcaagta ttaagtgaga tggatcatgtg 15360  
tggcgggtca ctatatgtta aaccagggtg aacatcatcc ggtgatgcta caactgctta 15420  
tgctaatagt gtctttaaca tttgtcaagc tgttacagcc aatgtaaatg cacttctttc 15480  
aactgatggg aataagatag ctgacaagta tgtccgcaat ctacaacaca ggctctatga 15540  
gtgtctctat agaaataggg atgttgatca tgaattcgtg gatgagtttt acgcttacct 15600  
gcgtaaacat ttctccatga tgattctttc tgatgatgcc gttgtgtgct ataacagtaa 15660  
ctatgaggct caaggtttag tagctagcat taagaacttt aaggcagttc tttattatca 15720  
aaataatgtg ttcattgtctg aggcaaatg ttggactgag actgacctta ctaaaggacc 15780

tcacgaattt tgctcacagc atacaatgct agttaaaciaa ggagatgatt acgtgtacct 15840  
gccttaccca gatccatcaa gaatattagg cgcaggctgt tttgtcgatg atattgtcaa 15900  
aacagatggg acacttatga ttgaaagggt cgtgtcactg gctattgatg cttaccact 15960  
tacaaaacat cctaatacagg agtatgctga tgtctttcac ttgtatttac aatacattag 16020  
aaagttacat gatgagctta ctggccacat gttggacatg tattccgtaa tgctaactaa 16080  
tgataacacc tcacgggtact gggaacctga gttttatgag gctatgtaca caccacatac 16140  
agtcttgag gctgtagggtg cttgtgtatt gtgcaattca cagacttcac ttcgttgagg 16200  
tgctgtatt aggagaccat tcctatgttg caagtgtgc tatgaccatg tcatttcaac 16260  
atcacacaaa ttagtggtgt ctgttaatcc ctatgtttgc aatgccccag gttgtgatgt 16320  
cactgatgtg acacaactgt atctaggagg tatgagctat tattgcaagt cacataagcc 16380  
tccattagt tttccattat gtgctaattg tcagggtttt ggtttataca aaaacacatg 16440  
tgtaggcagt gacaatgtca ctgacttcaa tgcgatagca acatgtgatt ggactaatgc 16500  
tggtgattac atacttgcca acactgtac tgagagactc aagcttttcg cagcagaaac 16560  
gctcaaagcc actgaggaaa catttaagct gtcatatggt attgccactg tacggaagt 16620  
actctctgac agagaattgc atctttcatg ggagggttga aaacctagac caccattgaa 16680  
cagaaactat gtctttactg gttaccgtgt aactaaaaat agtaaagtac agattggaga 16740  
gtacaccttt gaaaaagggtg actatggtga tgctgttggt tacagaggta ctacgacata 16800  
caagttgaat gttggtgatt actttgtgtt gacatctcac actgtaatgc cacttagtgc 16860  
acctactcta gtgccacaag agcactatgt gagaattact ggcttgtagc caacactcaa 16920  
catctcagat gagttttcta gcaatgttg aaattatcaa aaggtcggca tgcaaaagta 16980  
ctctacactc caaggaccac ctggtactgg taagagtcac tttgccatcg gacttgctct 17040  
ctattacca tctgctcgca tagtgatatac ggcatgctct catgcagctg ttgatgcct 17100  
atgtgaaaag gcattaaaat atttgccat agataaatgt agtagaatca tacctgcgcg 17160  
tgcgcgcgta gagggttttg ataaattcaa agtgaattca aactagaac agtatgtttt 17220  
ctgcaactga aatgcattgc cagaaacaac tgctgacatt gtagtctttg atgaaatctc 17280  
tatggctact aattatgact tgagtggtgt caatgctaga cttcgtgcaa aactacgt 17340  
ctatattggc gatcctgctc aattaccagc ccccgacaca ttgctgacta aaggcacact 17400



agaaccagaa	tattttaatt	cagtgtgcag	acttatgaaa	acaataggtc	cagacatggt	17460
ccttggaact	tgtcgccgtt	gtcctgctga	aattgttgac	actgtgagtg	ctttagttta	17520
tgacaataag	ctaaaagcac	acaaggataa	gtcagctcaa	tgcttcaaaa	tgttctacaa	17580
agggtgttatt	acacatgatg	tttcatctgc	aatcaacaga	cctcaaatag	gcgttgtaag	17640
agaattttctt	acacgcaatc	ctgcttggag	aaaagctggt	tttatctcac	cttataattc	17700
acagaacgct	gtagcttcaa	aaatccttagg	attgcctacg	cagactgttg	attcatcaca	17760
gggttctgaa	tatgactatg	tcatattcac	acaaactact	gaaacagcac	actcttgtaa	17820
tgtcaaccgc	ttcaatgtgg	ctatcacaag	ggcaaaaatt	ggcattttgt	gcataatgtc	17880
tgatagagat	ctttatgaca	aactgcaatt	tacaagtcta	gaaataccac	gtcgcaatgt	17940
ggctacatta	caagcagaaa	atgtaactgg	actttttaag	gactgtagta	agatcattac	18000
tggtcttcat	cctacacagg	cacctacaca	cctcagcggt	gatataaagt	tcaagactga	18060
aggattatgt	gttgacatac	caggcatacc	aaaggacatg	acctaccgta	gactcatctc	18120
tatgatgggt	ttcaaaatga	attaccaagt	caatgggttac	cctaatatgt	ttatcacccg	18180
cgaagaagct	attcgtcacg	ttcgtgcgtg	gattggcttt	gatgtagagg	gctgtcatgc	18240
aactagagat	gctgtgggta	ctaacctacc	tctccagcta	ggattttcta	cagggtgttaa	18300
cttagtagct	gtaccgactg	gttatgttga	cactgaaaat	aacacagaat	tcaccagagt	18360
taatgcaaaa	cctccaccag	gtgaccagtt	taaacatctt	ataccactca	tgtataaagg	18420
cttgccctgg	aatgtagtgc	gtattaagat	agtacaaatg	ctcagtgata	cactgaaagg	18480
attgtcagac	agagtcgtgt	tcgtcctttg	ggcgcattgg	tttgagctta	catcaatgaa	18540
gtactttgtc	aagattggac	ctgaaagaac	gtgttgctctg	tgtgacaaac	gtgcaacttg	18600
cttttctact	tcatcagata	cttatgcctg	ctggaatcat	tctgtggggt	ttgactatgt	18660
ctataacca	tttatgattg	atgttcagca	gtggggcttt	acgggtaacc	ttcagagtaa	18720
ccatgaccaa	cattgccagg	tacatggaaa	tgcacatgtg	gctagtgtgtg	atgctatcat	18780
gactagatgt	ttagcagtcc	atgagtgcct	tgtaagcgc	gttgattgggt	ctggtgaata	18840
ccctattata	ggagatgaac	tgagggttaa	ttctgcttgc	agaaaagtac	aacacatggt	18900
tgtgaagtct	gcattgcttg	ctgataagtt	tccagttctt	catgacatag	gaaatccaaa	18960
ggctatcaag	tgtgtgcctc	aggctgaagt	agaatggaag	ttctacgatg	ctcagccatg	19020
tagtgacaaa	gcttacaaaa	tagaggaact	cttctattct	tatgctatac	atcacgataa	19080

attcactgat ggtgtttgtt tgttttggaa ttgtaacgtt gatcgttacc cagccaatgc 19140  
 aattgtgtgt aggtttgaca caagagtctt gtcaaacttg aacttaccag gctgtgatgg 19200  
 tggtagtttg tatgtgaata agcatgcatt ccacactcca gctttcgata aaagtgcatt 19260  
 tactaattta aagcaattgc ctttctttta ctattctgat agtccttgtg agtctcatgg 19320  
 caaacaagta gtgtcggata ttgattatgt tccactcaaa tctgctacgt gtattacacg 19380  
 atgcaattta ggtgggtgctg tttgcagaca ccatgcaaag gagtaccgac agtacttggg 19440  
 tgcataata atgatgattt ctgctggatt tagcctatgg atttacaac aatttgatac 19500  
 ttataacctg tggaatacat ttaccagggt acagagttta gaaaatgtgg cttataatgt 19560  
 tgttaataaa ggacactttg atggacacgc cggcgaagca cctgtttcca tcattaataa 19620  
 tgctgtttac acaaaggtag atggtattga tgtggagatc tttgaaaata agacaacact 19680  
 tcctgttaat gttgcatttg agctttgggc taagcgtaac attaaaccag tgccagagat 19740  
 taagatactc aataatttgg gtgttgatat cgctgctaact actgtaactt gggactacaa 19800  
 aagagaagcc ccagcacatg tatctacaat aggtgtctgc acaatgactg acattgccaa 19860  
 gaaacctact gagagtgtt gttcttcact tactgtcttg tttgatggta gagtggaagg 19920  
 acaggtagac ctttttagaa acgcccgtaa tgggtgtttta ataacagaag gttcagtcaa 19980  
 aggtctaaca ccttcaaagg gaccagcaca agctagcgtc aatggagtca cattaattgg 20040  
 agaatcagta aaaacacagt ttaactactt taagaaagta gacggcatta ttcaacagtt 20100  
 gcctgaaacc tactttactc agagcagaga cttagaggat tttaagccca gatcacaaat 20160  
 ggaaactgac tttctcgagc tcgctatgga tgaattcata cagcgatata agctcgaggg 20220  
 ctatgccttc gaacacatcg tttatggaga tttcagtcac ggacaacttg gcggtcttca 20280  
 tttaatgata ggcttagcca agcgctcaca agattcacca cttaaattag aggattttat 20340  
 ccctatggac agcacagtga aaaattactt cataacagat gcgcaaacag gttcatcaaa 20400  
 atgtgtgtgt tctgtgattg atcttttact tgatgacttt gtcgagataa taaagtcaca 20460  
 agatttgtca gtgatttcaa aagtgggtcaa gggtacaatt gactatgctg aaatttcatt 20520  
 catgcttttg tgtaaggatg gacatgttga aaccttctac ccaaaactac aagcaagtca 20580  
 agcgtggcaa ccagggtgtg cgatgcctaa cttgtacaag atgcaaagaa tgcttcttga 20640  
 aaagtgtgac cttcagaatt atgggtgaaa tgctgttata ccaaaggaa taatgatgaa 20700

tgtcgcaaag tatactcaac tgtgtcaata cttaaataca cttacttttag ctgtacccta 20760  
 caacatgaga gttattcact ttgggtgctgg ctctgataaa ggagttgcac caggtacagc 20820  
 tgtgctcaga caatgggtgc caactggcac actacttgte gattcagatc ttaatgactt 20880  
 cgtctccgac gcagattcta ctttaattgg agactgtgca acagtacata cggctaataa 20940  
 atgggacctt attattagcg atatgtatga ccctaggacc aaacatgtga caaaagagaa 21000  
 tgactctaaa gaagggtttt tcacttatct gtgtggattt ataaagcaa aactagccct 21060  
 ggggtggttct atagctgtaa agataacaga gcattcttgg aatgctgacc tttaacaagct 21120  
 tatggggccat ttctcatggg ggacagcttt tgttacaaat gtaaatacat catcatcgga 21180  
 agcatttttta attggggcta actatcttgg caagccgaag gaacaaattg atggctatac 21240  
 catgcatgct aactacattt tctggaggaa cacaaatcct atccagttgt cttcctattc 21300  
 actctttgac atgagcaaat ttctcttaa attaagagga actgctgtaa tgtctcttaa 21360  
 ggagaatcaa atcaatgata tgatttatct tcttctggaa aaaggtaggc ttatcattag 21420  
 agaaaacaac agagttgtgg tttcaagtga tattcttgtt aacaactaaa cgaacatggt 21480  
 tattttctta ttatttctta ctctcactag tggtagtgac cttgaccggt gcaccacttt 21540  
 tgatgatggt caagctccta attacactca acatacttca tctatgaggg ggggtttacta 21600  
 tcctgatgaa attttttagat cagacactct ttatttaact caggatttat ttcttccatt 21660  
 ttattctaatt gttacagggt ttcatactat taatcatagc tttggcaacc ctgtcatacc 21720  
 ttttaaggat ggtattttatt ttgctgccac agagaaatca aatgttgtcc gtgggtgggt 21780  
 ttttggttct accatgaaca acaagtcaca gtcggtgatt attattaaca attctactaa 21840  
 tgttggtata cgagcatgta actttgaatt gtgtgacaac cctttctttg ctggttctaa 21900  
 acccatgggt acacagacac atactatgat attcgataat gcatttaatt gcactttcga 21960  
 gtacatatct gatgcctttt cgcttgatgt ttcagaaaag tcaggtaatt ttaaactt 22020  
 acgagagttt gtgtttaaaa ataaagatgg gtttctctat gttataagg gctatcaacc 22080  
 tatagatgta gttcgtgatc taccttctgg ttttaacact ttgaaaccta tttttaagtt 22140  
 gcctcttgggt attaacatta caaattttag agccattctt acagcctttt cacctgctca 22200  
 agacatttgg ggcacgtcag ctgcagccta ttttgttggc tatttaaagc caactacatt 22260  
 tatgctcaag tatgatgaaa atggtacaat cacagatgct gttgattggt ctcaaatcc 22320  
 acttgetgaa ctcaaatgct ctgttaagag ctttgagatt gacaaaggaa tttaccagac 22380

ctctaatttc	agggttgttc	cctcaggaga	tgttgtgaga	ttccctaata	ttacaaactt	22440
gtgtcctttt	ggagagggtt	ttaatgctac	taaattccct	tctgtctatg	catggggagag	22500
aaaaaaaaatt	tctaattgtg	ttgctgatta	ctctgtgctc	tacaactcaa	catttttttc	22560
aacctttaag	tgctatggcg	tttctgccac	taagttgaat	gatctttgct	tctccaatgt	22620
ctatgcagat	tctttttag	tcaagggaga	tgatgtaaga	caaatagcgc	caggacaaac	22680
tggtgttatt	gctgattata	attataaatt	gccagatgat	ttcatggggt	gtgtccttgc	22740
ttggaatact	aggaacattg	atgctacttc	aactggtaat	tataattata	aatataggta	22800
tcttagacat	ggcaagctta	ggccctttga	gagagacata	tctaattgtc	ctttctcccc	22860
tgatggcaaa	ccttgcaccc	cacctgctct	taattgttat	tggccattaa	atgattatgg	22920
tttttacacc	actactggca	ttggctacca	accttacaga	gttgtagtac	tttcttttga	22980
acttttaaat	gcaccggcca	cggtttgtgg	accaaatta	tccactgacc	ttattaagaa	23040
ccagtgtgtc	aattttaatt	ttaatggact	cactgggtact	ggtgtgttaa	ctccttcttc	23100
aaagagattt	caaccatttc	aacaatttgg	ccgtgatgtt	tctgatttca	ctgattccgt	23160
tcgagatcct	aaaacatctg	aaatattaga	catttcacct	tgctcttttg	ggggtgtaag	23220
tgtaattaca	cctggaacaa	atgcttcac	tgaagttgct	gttctatata	aagatgttaa	23280
ctgcactgat	gtttctacag	caattcatgc	agatcaactc	acaccagctt	ggcgcatata	23340
ttctactgga	aacaatgtat	tccagactca	agcaggctgt	cttataggag	ctgagcatgt	23400
cgacacttct	tatgagtgcg	acattcctat	tggagctggc	atttgtgcta	gttaccatac	23460
agtttcttta	ttacgtagta	ctagccaaaa	atctattgtg	gcttatacta	tgtcttttagg	23520
tgctgatagt	tcaattgctt	actctaataa	caccattgct	atacctacta	acttttcaat	23580
tagcattact	acagaagtaa	tgctgtttc	tatggctaaa	acctccgtag	attgtaatat	23640
gtacatctgc	ggagattcta	ctgaatgtgc	taatttgctt	ctccaatatg	gtagcttttg	23700
cacacaacta	aatcgtgcac	tctcaggtat	tgctgtgtaa	caggatcgca	acacacgtga	23760
agtgttcgct	caagttaaac	aaatgtacaa	aacccaact	ttgaaatatt	ttggtgggtt	23820
taatttttca	caaataattac	ctgaccctct	aaagccaact	aagaggtctt	ttattgagga	23880
cttgcctctt	aataagggtga	cactcgctga	tgctggcttc	atgaagcaat	atggcgaaatg	23940
cctaggtgat	attaatgcta	gagatctcat	ttgtgcgcag	aagttcaatg	gacttacagt	24000

gttgccacct ctgctcactg atgatatgat tgctgcctac actgctgctc tagttagtgg 24060  
 tactgccact gctggatgga catttggtgc tggcgctgct cttcaaatac cttttgctat 24120  
 gcaaattggca tataggttca atggcattgg agttacccaa aatgttctct atgagaacca 24180  
 aaaacaaatc gccaaccaat ttaacaaggc gattagtcaa attcaagaat cacttacaac 24240  
 aacatcaact gcattgggca agctgcaaga cgttgttaac cagaatgctc aagcattaaa 24300  
 cacacttggt aaacaactta gctctaattt tgggtgcaatt tcaagtgtgc taaatgatat 24360  
 cctttcgcgga cttgataaag tcgaggcgga ggtacaaatt gacagggttaa ttacaggcag 24420  
 acttcaaagc cttcaaacct atgtaacaca acaactaatc agggctgctg aaatcagggc 24480  
 ttctgctaatt cttgctgcta ctaaaatgtc tgagtgtgtt cttggacaat caaaaagagt 24540  
 tgacttttgt ggaaagggct accaccttat gtccttccca caagcagccc cgcattggtg 24600  
 tgtcttccta catgtcacgt atgtgccatc ccaggagagg aacttcacca cagcgccagc 24660  
 aatttgtcat gaaggcaaag catacttccc tcgtgaaggc gtttttgtgt ttaatggcac 24720  
 ttcttggttt attacacaga ggaacttctt ttctccacaa ataattacta cagacaatac 24780  
 atttgtctca ggaaattgtg atgtcgttat tggcatcatt aacaacacag tttatgatcc 24840  
 tctgcaacct gagcttgact cattcaaaga agagctggac aagtacttca aaaatcatac 24900  
 atcaccagat gttgatcttg gcgacatttc aggcattaac gcttctgtcg tcaacattca 24960  
 aaaagaaatt gaccgcctca atgaggtcgc taaaaattta aatgaatcac tcattgacct 25020  
 tcaagaattg ggaaaatatg agcaatatat taaatggcct tggatatgtt ggctcggctt 25080  
 cattgctgga ctaattgcc a tcgtcatggt tacaatcttg ctttgttgca tgactagtgt 25140  
 ttgcagttgc ctcaaggggt catgctcttg tggttcttgc tgcaagtttg atgaggatga 25200  
 ctctgagcca gttctcaagg gtgtcaaatt acattacaca taaacgaact tatggatttg 25260  
 tttatgagat tttttactct tggatcaatt actgcacagc cagtaaaaat tgacaatgct 25320  
 tctcctgcaa gtactgttca tgctacagca acgataccgc tacaagcctc actcccttct 25380  
 ggatggcttg ttattggcgt tgcatttctt gctgttttct agagcgctac caaaataatt 25440  
 gcgctcaata aaagatggca gctagccctt tataagggct tcagttcat ttgcaattta 25500  
 ctgctgctat ttgttaccat ctattcacat cttttgcttg tcgctgcagg tatggaggcg 25560  
 caatttttgt acctctatgc cttgatatat tttctacaat gcatcaacgc atgtagaatt 25620  
 attatgagat gttggcttgg ttggaagtgc aaatccaaga acccattact ttatgatgcc 25680

aactactttg ttgctggca cacacataac tatgactact gtataccata taacagtgtc 25740  
acagatacaa ttgtcgttac tgaagggtgac ggcatttcaa caccaaaact caaagaagac 25800  
taccaaattg gtggttattc tgaggatagg cactcagggtg ttaaagacta tgtcggttga 25860  
catggctatt tcaccgaagt ttactaccag cttgagtcta cacaaattac tacagacact 25920  
ggatttgaat atgctacatt cttcatcttt aacaagcttg ttaaagaccc accgaatgtg 25980  
caaatacaca caatcgacgg ctcttcagga gttgctaata cagcaatgga tccaatttat 26040  
gatgagccga cgacgactac tagcgtgcct ttgtaagcac aagaaagtga gtacgaactt 26100  
atgtactcat tcgtttcgga agaaacaggc acgttaatat ttaatagcgt acttcttttt 26160  
cttgctttcg tggattcttc gctagtcaca ctagccatcc ttactgcgtc tcgattgtgt 26220  
gcgtactgct gcaatattgt taacgtgagt ttagtaaaac caacggttta cgtctactcg 26280  
cgtgttaaaa atctgaactc ttctgaagga gttcctgata ttctgggtcta aacgaactaa 26340  
ctattattat tattctgttt ggaactttta cattgcttat catggcagac aacggtacta 26400  
ttaccgttga ggagcttaaa caactcctgg aacaatggaa cctagtaata ggtttcctat 26460  
tcctagcctg gattatgtta ctacaatttg cctattctaa tcggaacagg tttttgtaca 26520  
taataaagct tgttttcctc tggctcttgt ggccagtaac acttgcttgt tttgtgcttg 26580  
ctgctgtcta cagaattaat tgggtgactg gcgggattgc gattgcaatg gcttgtattg 26640  
taggcttgat gtggcttagc tacttcgttg ctcccttcag gctgtttgct cgtaccgcgt 26700  
caatgtggtc attcaacca gaaacaaaca ttcttctcaa tgtgcctctc cgggggacaa 26760  
ttgtgaccag accgctcatg gaaagtgaac ttgtcattgg tgctgtgata attcgtgggc 26820  
acttgccaat ggccggacac tccctagggc gctgtgacat taaggacctg ccaaagaga 26880  
tcaactgtgc tacatcacga acgctttctt attacaaatt aggagcgtcg cagcgtgtag 26940  
gcactgattc aggttttgct gcatacaacc gctaccgtat tggaaactat aaattaaata 27000  
cagaccacgc cggtagcaac gacaatattg ctttgctagt acagtaagtg acaacagatg 27060  
tttcatcttg ttgacttcca gggtacaata gcagagatat tgattatcat tatgaggact 27120  
ttcaggattg ctatttggaa tcttgacgtt ataataagtt caatagttag acaattattt 27180  
aagcctctaa ctaagaagaa ttattcggag ttagatgatg aagaacctat ggagtttagat 27240  
tatccataaa acgaacatga aaattattct ctctctgaca ttgattgtat ttacatcttg 27300

cgagctatat	cactatcagg	agtgtgtag	aggtagact	gtactactaa	aagaaccttg	27360
cccatcagga	acatacgagg	gcaattcacc	atttcaccct	cttgctgaca	ataaatttgc	27420
actaacttgc	actagcacac	acttttgctt	tgcttgctgct	gacggtactc	gacataccta	27480
tcagctgcgt	gcaagatcag	tttcacaaaa	actttttcatc	agacaagagg	aggttcaaca	27540
agagctctac	tcgccacttt	ttctcattgt	tgctgctcta	gtatttttaa	tacttttgctt	27600
caccattaag	agaaagacag	aatgaatgag	ctcactttta	ttgacttcta	tttgctgctt	27660
ttagcctttc	tgctattcct	tgttttaata	atgcttatta	tattttgggt	ttcactcgaa	27720
atccaggatc	tagaagaacc	ttgtacaaaa	gtctaaacga	acatgaaact	tctcattggt	27780
ttgacttgta	tttctctatg	cagttgcata	tgactgtag	tacagcgctg	tgcatcta	27840
aaacctcatg	tgcttgaaga	tccttgtaag	gtacaacact	aggggtaata	cttatagcac	27900
tgcttggtt	tgctgcttag	gaaagggttt	accttttcat	agatggcaca	ctatgggttca	27960
aacatgcaca	cctaattgta	ctatcaactg	tcaagatcca	gctgggtggtg	cgcttatagc	28020
taggtgttg	taccttcacg	aaggtcacca	aactgctgca	tttagagacg	tacttggtgt	28080
tttaaataaa	cgaacaaatt	aaaatgtctg	ataatggacc	ccaatcaa	caacgtagtg	28140
cccccgcat	tacatttggt	ggaccacag	attcaactga	caataaccag	aatggaggac	28200
gcaatggggc	aaggccaaaa	cagcgccgac	ccaagggtt	accaataat	actgcgtctt	28260
ggttcacagc	tctcactcag	catggcaagg	aggaaacttag	attccctcga	ggccagggcg	28320
ttccaatcaa	caccaatagt	ggtccagatg	accaaattgg	ctactaccga	agagctaccc	28380
gacgagttcg	tggtggtgac	ggcaaaatga	aagagctcag	cccagatgg	tacttctatt	28440
acctaggaac	tggcccagaa	gcttcacttc	cctacggcgc	taacaaagaa	ggcatcgat	28500
gggttgcaac	tgaggagacc	ttgaatacac	caaagacca	cattggcacc	cgcaatccta	28560
ataacaatgc	tgccaccgtg	ctacaacttc	ctcaaggaa	aacattgcca	aaaggcttct	28620
acgcagaggg	aagcagaggg	ggcagtcaag	cctcttctcg	ctcctcatca	cgtagtcgcg	28680
gtaattcaag	aaattcaact	cctggcagca	gtaggggaaa	ttctcctgct	cgaatggcta	28740
gcggaggtgg	tgaaactgcc	ctcgcgctat	tgctgctaga	cagattgaac	cagcttgaga	28800
gcaaagtttc	tggttaaaggc	caacaacaac	aaggccaaac	tgtcactaag	aaatctgctg	28860
ctgaggcatc	taaaaagcct	cgccaaaaac	gtactgccac	aaaacagtac	aacgtcactc	28920
aagcatttgg	gagacgtggt	ccagaacaaa	ccaaggaaa	tttcggggac	caagacctaa	28980

tcagacaagg aactgattac aaacattggc cgcaaattgc acaatttgct ccaagtgcct 29040  
 ctgcattctt tggaatgtca cgcattggca tggaagtcac accttcggga acatggctga 29100  
 cttatcatgg agccattaaa ttggatgaca aagatccaca attcaaagac aacgtcatac 29160  
 tgctgaacaa gcacattgac gcatacaaaa cattcccacc aacagagcct aaaaaggaca 29220  
 aaaagaaaaa gactgatgaa gctcagcctt tgccgcagag acaaaagaag cagcccactg 29280  
 tgactcttct tcttgcggct gacatggatg atttctccag acaacttcaa aattccatga 29340  
 gtggagcttc tgctgattca actcaggcat aaacactcat gatgaccaca caaggcagat 29400  
 gggctatgta aacgttttctg caattccgtt tacgatacat agtctactct tgtgcagaat 29460  
 gaattctcgt aactaaacag cacaagtagg tttagttaac tttaatctca catagcaatc 29520  
 tttaatcaat gtgtaacatt agggaggact tgaaagagcc accacatttt catcgaggcc 29580  
 acgcggagta cgatcgaggg tacagtgaat aatgctaggg agagctgcct atatggaaga 29640  
 gccctaattgt gtaaaattaa ttttagtagt gctatcccca tgtgatttta atagcttctt 29700  
 aggagaatga c 29711

<210> 10  
 <211> 31  
 <212> DNA  
 <213> SARS coronavirus

<400> 10  
 cgggatccat gtctgataat ggaccccaat c 31

<210> 11  
 <211> 31  
 <212> DNA  
 <213> SARS coronavirus

<400> 11  
 acgcgtcgac ttatgcctga gttgaatcag c 31

<210> 12  
 <211> 31  
 <212> DNA  
 <213> SARS coronavirus

<400> 12  
 cgggatccat gtctgataat ggaccccaat c 31



<210> 13  
<211> 30  
<212> DNA  
<213> SARS coronavirus

<400> 13  
acgcgtcgac tcgagcagga gaatttcccc 30

<210> 14  
<211> 31  
<212> DNA  
<213> SARS coronavirus

<400> 14  
cgggatccaa ccagcttgag agcaaagttt c 31

<210> 15  
<211> 31  
<212> DNA  
<213> SARS coronavirus

<400> 15  
acgcgtcgac ttatgcctga gttgaatcag c 31

<210> 16  
<211> 29  
<212> DNA  
<213> SARS coronavirus

<400> 16  
cgggatccgc cttgaataca cccaaagac 29

<210> 17  
<211> 30  
<212> DNA  
<213> SARS coronavirus

<400> 17  
acgcgtcgac aaattgtgca atttgcggcc 30

<210> 18  
<211> 29  
<212> DNA  
<213> SARS coronavirus

<400> 18  
cgggatccgc cttgaataca cccaaagac 29

<210> 19

<211> 28  
<212> DNA  
<213> SARS coronavirus

<400> 19  
acgcgtcgac agcaggagaa tttccctt 28

<210> 20  
<211> 29  
<212> DNA  
<213> SARS coronavirus

<400> 20  
cgggatcctt gaaccagctt gagagcaaa 29

<210> 21  
<211> 30  
<212> DNA  
<213> SARS coronavirus

<400> 21  
acgcgtcgac aaattgtgca atttgcggcc 30

<210> 22  
<211> 29  
<212> DNA  
<213> SARS coronavirus

<400> 22  
cgggatccga tccacaattc aaagacaac 29

<210> 23  
<211> 31  
<212> DNA  
<213> SARS coronavirus

<400> 23  
acgcgtcgac ttatgcctga gttgaatcag c 31

<210> 24  
<211> 32  
<212> DNA  
<213> SARS coronavirus

<220>  
<221> misc\_feature  
<222> (3)..(8)

<400> 24

cgggatccaa cgtcatactg ctgaacaagc ac

32

<210> 25

<211> 31

<212> DNA

<213> SARS coronavirus

<220>

<221> misc\_feature

<222> (5)..(10)

<400> 25

acgcgctcgac ttatgcctga gttgaatcag c

31